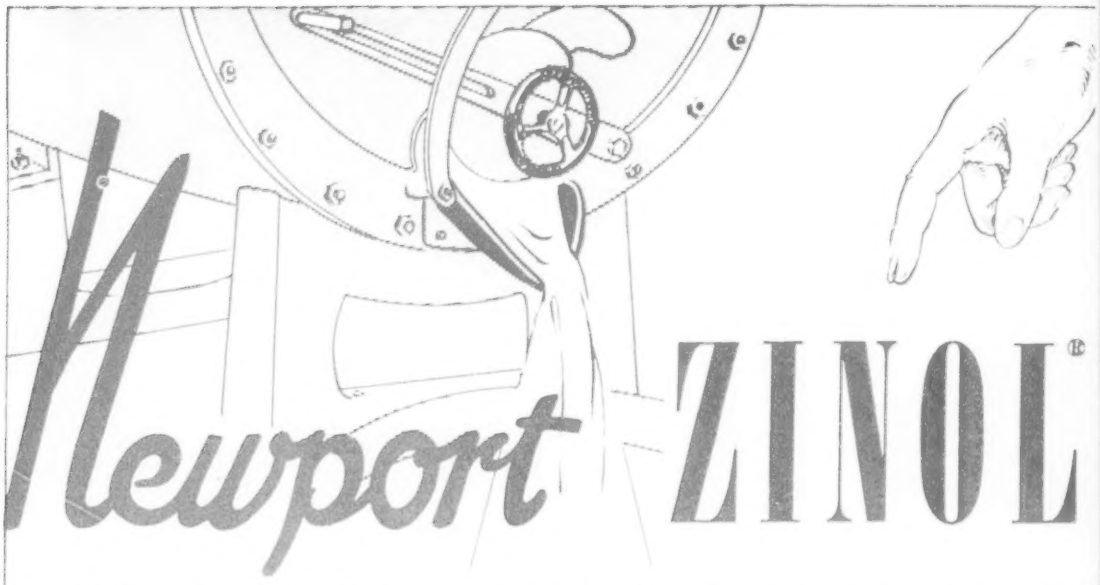
PAINT and varnish PRODUCTION

Established 1910

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHES

OCTOBER
1949



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PLASKON 3311

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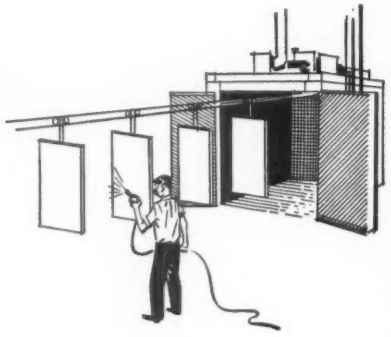

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PLASKON 3311 has been successfully used in refrigerator enamels and similar applications.

TYPICAL CHARACTERISTICS

Solids (%)	50±1
Butanol (%)	30
Xylol (%)	20
Viscosity (G.H.)	V-X
Color	Water White
Acid Number (Solids)	5-7
Pounds Per Gallon	8.42
Compatibilities (By Vol.)	
Xylol	Complete
Pet. Nap. (K.B. 70)	5-6:1
Min. Sp. (K.B. 35)	1.3-2.0:1

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Announcement

EFFECTIVE with this issue we have acquired PAINT AND VARNISH PRODUCTION MANAGER, founded by Louis Drake in 1910.

With completely new format, addition of new departments and modernized style, the publication will be broadened to cover all phases of paint, varnish, lacquer and other surface coating production.

Recent broad advances in technology will receive full attention in this, the only wholly technical and production, magazine of the industry. The name has been shortened to:

PAINT AND VARNISH PRODUCTION

Anthony Errico, formerly Engineering Editor of "Organic Finishing", is the new editor. His long experience in both the practical and scientific phases of paint production assure a full understanding of the industry and its problems.

PAINT AND VARNISH PRODUCTION goes *by name* to 2,130 men responsible for production in every paint and allied manufacturing plant in the U. S. A., Canada, and many foreign countries. As the specialized production magazine of the industry, established in 1910, it now begins a new era of wider service, which we feel will warrant the support and cooperation of the industry.

The *new* PAINT AND VARNISH PRODUCTION, even though 39 years old, will in effect be a new magazine—a completely alive and modern publication designed to serve the needs of the production men of the surface coating industry everywhere.

By J. Hutcheson Publisher

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FEATURES

DEPARTMENTS

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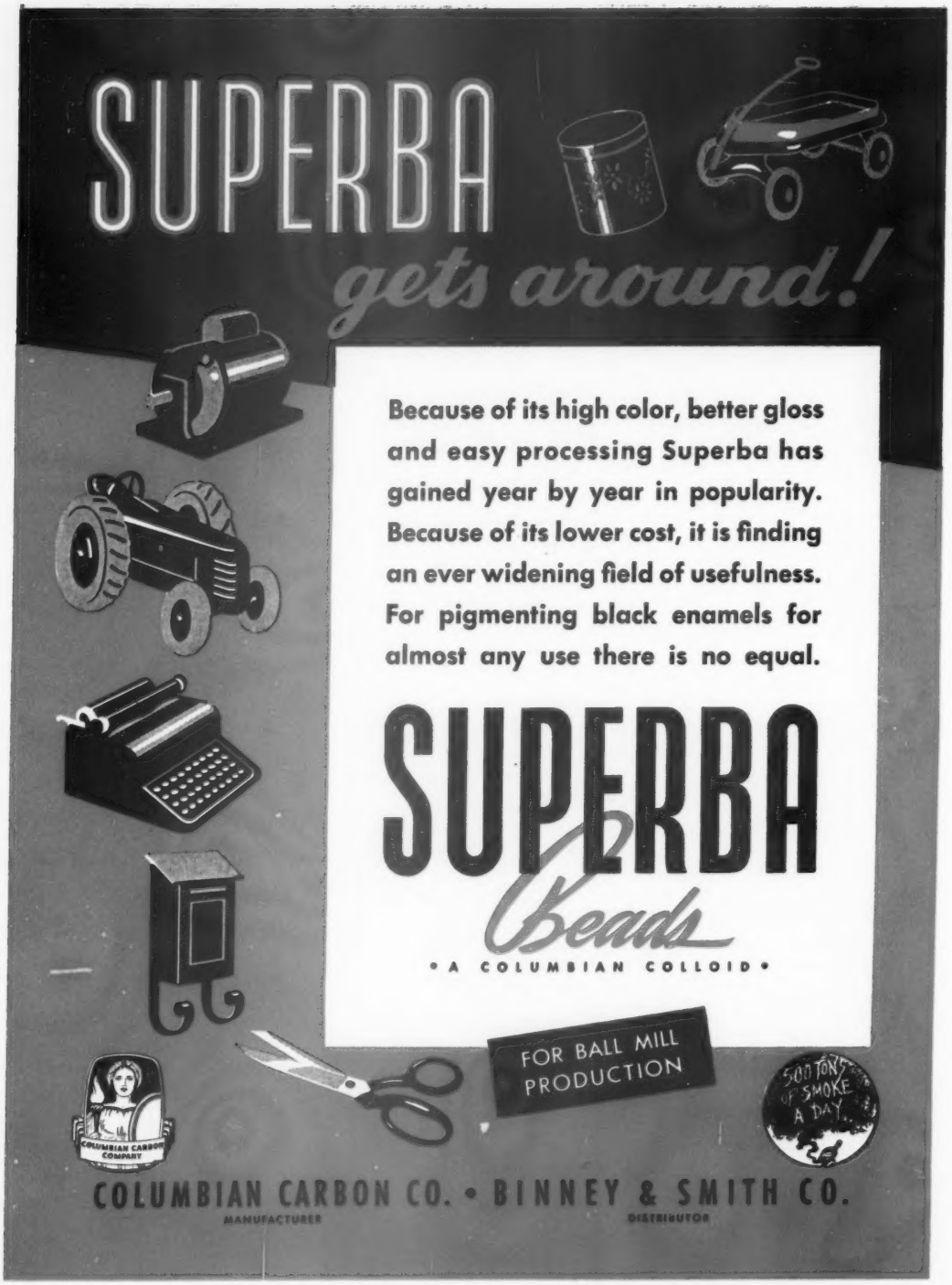

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Editorial Comment

Paint Poisoning?

RECENTLY, there has been some news about paint poisoning which has brought about a misunderstanding as to the actual causes which contributed to this poisoning. In one instance, the death of a 4 year old girl, according to news stories, was attributed to lead poisoning due to her habit of eating the finish or paint off furniture. In another, the burning of paint was considered poisonous, and there was considerable belief that smoldering paint was largely responsible for the toxic fumes which overcame firemen. After exhaustive studies, some interesting data was collected, which in both cases mentioned, refuted the original claims that paint was to blame.

The Scientific Section of N. P. V. L. A. investigated the case of the 4 year old girl. Thorough tests of the coatings on the chewed furniture were made, and no trace of lead on any of the items that were chewed was found. It was further discovered that her gnawing habits were not restricted to furniture. Other items chewed were porch rails, the exterior window sill and the interior bannister. All of these seem to have been painted with similar exterior paint and did contain lead which could have contributed to lead poisoning.

It is quite probable that she could have consumed a considerable quantity of lead over a period of a year by chewing the window sill, the railings or the bannister.

As John C. Moore, director of the Scientific Section pointed out: "Manufacturers of finishes for furniture, cribs and toys have for many years used non-toxic ingredients which would make lead poisoning impossible, and lead paints are commonly used where surface is exposed to the elements. The possibility of anyone eating exterior paint, especially in such quantities as consumed by the child is a rare and unusual occurrence."

In the case of burning paint, an exhaustive study of the behavior of painted surfaces during fires was undertaken by the Association in response to wide public concern aroused by hotel fires.

It was pointed out that toxic gas hazards are greater when a fire is smoldering and smoking rather than burning briskly. Thus, research was concerned chiefly with carbon monoxide formed by incomplete oxidation.

It was found that carbon monoxide and other gases coming from smoldering paint are insignificant compared with the much greater contribution of carbon monoxide from burning structures and other material fed on by fires. The report further stated that for all practical purposes paint gases can be ignored when estimating the relative toxicity of all possible materials that might become decomposed in an actual building fire.

In both cases, early and premature reports misinformed the public and were unfair to the manufacturers of paint materials.

The work of the Association in this regard is to be commended in undertaking the responsibility to inevstigate such incidents, and seeing to it that the public is correctly informed. There is no doubt that this service has done much toward strengthening the prestige of the paint industry in the eyes of the public.

Paint Conventions

THE 61st Annual Convention of the National, Paint, Varnish and Lacquer Association will be held in Atlantic City, N. J. on October 31st through November 2nd. This will be immediately followed by the 27th Annual Meeting of the Federation of the Paint and Varnish Production Clubs running from November 3rd through November 5th. These meetings will feature timely papers on the recent advancements made in paint technology, and the Federation will sponsor their usual Paint Industries' Show exhibiting new materials and equipment. Enough said—will see you in Atlantic City.

Mixing and G

in paint m

WHILE chemical changes or unit processes are involved in the manufacture of the main constituents of paints as well as in the drying of the film, the various operations needed to mix and grind these individual constituents so that a homogeneous product is obtained, are wholly physical in nature. The latter statement may lead to believe that due to their physical nature, mixing and grinding are simple and offer very little problems to the paint manufacturer and can be taken as matters of fact. However, the above offers many diversified problems, some of which we shall discuss below.

Grinding Proportions

IT is imperative that in all mixing and grinding operations the proportions of pigment to vehicle be exact. These proportions are not arrived at haphazardly, but they are the result of years of experience and continuous research. The goal that one has to strive for is to have a mixture of such a balanced homogeneity that maximum grinding efficiency is obtained, thereby decreasing the drying time to a minimum.

In this connection, it is strongly recommended that paint constituents be mixed only after a thorough study of their dispersing properties. The tests outlined by *F. K. Daniel* and *P. Goldman* in *Industrial and Engineering Chemistry* (*Jan. 1946*), offer an excellent technique for the rapid evaluation of dispersions and dispersing agents.

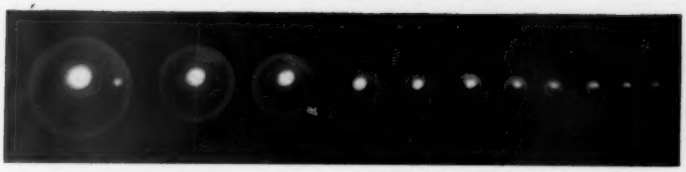
These tests involve the mixing of the dry powder, in our case the pigment, with the dispersing solution, measuring the amount of liquid required to produce two characteristic and reproducible consistencies and observing the rheological phenomena of the mixture. These test will show that a good dispersion displays active dilatancy at high pigment concentrations, while a poor dispersion is plastic over a wide range of concentrations and never displays any flow tendencies. Test batches made with the aid of data collected by using the Daniel titration method clearly showed the high value of proper pigment vehicle

Figure 1

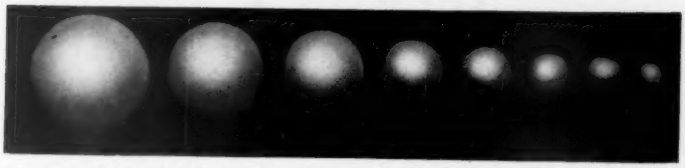
Figure 2

d Grinding

nt manufacture



Polished balls are made of high chrome alloy steel thus providing toughness and wear resistance.



Porcelain balls made of selected raw materials are thoroughly vitrified, hard and homogeneous.

Imported flint pebbles are uniform, hard and free from holes. (Courtesy of Abbé Engineering Co.)

ratio by increasing production as much as 50%.

From the above it was observed that pastes of higher pigment concentration could be efficiently made provided the vehicle proved to be a good dispersing agent. This higher pigment concentration will give a very efficient grinding mixture thus permitting a marked reduction in grinding time.

Listed below are a few suggested vehicle-pigment proportions:

A. *Paints that have an oil as a basic vehicle*

I. For basic lead carbonate and materials of similar nature, the oil should be in the neighborhood of 20–25%.

II. For lithopone, titanium, titanium-calcium and chrome yellow pigments, the oil should be round 30–35%.

III. In the case of iron blues, the oil should be increased to 50–60%.

IV. For carbon black and lampblacks, the oil should not be below 75%.

B. *Paints where the vehicle is of synthetic nature (alkyd resins)*

PIGMENT	RESIN SOLUTION	THINNER
Inerts and Fillers		
Whiting	1.7	1.7
Asbestine	3	3
Barytes	1.1	1.1
Whites		
Titanium	3	3
Titanium-Calcium	2.25	2.25
Yellows		
Lemon	3	3
Medium Chrome	2.8	2.8
Primrose	2.9	2.9
Chrome Orange	1.6	1.6
Molybdate	2.6	2.6
Reds		
Spanish Oxide	1.9	1.9
Indian	2.6	2.6
Calcium Lithol	10.2	10.2

Figure 3

Fig. 1 Chain drive type pebble mill. (Abbé Engineering Co.)

Fig. 2 Five roller mill with four hand wheels for roller setting.

Fig. 3 Four blade mixer for dispersing pigments prior to grinding.

PIGMENT	RESIN SOLUTION	THINNER
Toluidine	8.6	8.6
Greens		
Chrome	4.1	4.1
Blues		
Ultramarine	3.6	3.6
Milori	11.1	11.1
Blacks		
Carbon	104.3	104.3
Lampblack	12.6	12.6

All figures are in gallons and they represent the amounts of resin solution and thinner required to wet 100 lbs. of pigment. The thinner used in these series of experiments was varnolene. The resin solution was a medium oil alkyd resin 60% solids.

Mixing

OFTEN it has been stated that the subject of mixing probably has the least scientific foundation of all the unit processes in chemical engineering. There is no set formula or equation governing speed and time of mixing.

In the manufacture of paints, mixing is both a way of dispersing pigments and of preparing pastes for roller mill grinding. Therefore, the prime objective of mixing is to achieve such an ideal homogeneous condition where each particle of any one material will lie as nearly adjacent as possible to a particle of each of the other constituent materials.

Since it is not within the scope of this paper to go into the engineering of mixing equipment, we shall approach the problem of mixing merely as a step towards the preparation of a material suitable for proper grinding and in the course of the discussion we shall make mention of the machinery which is currently used throughout the industry today.

Probably, the oldest type mixer and one of the most popular is still the paddle mixer where the material to be mixed is actually carried around in a circular path. Since we are dealing with heavy pastes, the action of paddles is indispensable to knead the pastes. Various modifications of the original paddle mixer have been introduced by modifying the position and the design of the paddles. Typical of these are the gate type mixer where we have a combination of horizontal and vertical blades, and the horseshoe type for extra heavy materials.

As mentioned before, the exact time for mixing a given product can only be ascertained through experience. By trial and error one will be able to observe all the aspects of the grinding action, and thus be able to determine whether a given material is properly mixed and ready to be ground.

In general, however, when the composition is free flowing, free of lumps and semi- or fully homogeneous it is said to be thoroughly mixed.

Grinding

GRINDING of paints is done mainly in roll mills and in ball or pebble mills.

Roller mills are used extensively for grinding large quantities of paint in relatively short periods of time. This mill usually consists of three or more rolls operated at different speeds, which force the material between the rolls and subject it to a thorough rubbing action. This method of grinding is very advantageous since one has the possibility of pigments being ground to a very heavy paste with a greater rubbing effect visible at all times. This coupled with the facility of cleaning, thus permitting a rapid change from one color to another in a relatively short period of time, makes this mill an indispensable piece of equipment for the up-to-date paint plant.

For dark colors and great volume, pebble and ball mills are the best methods for grinding. This type mill offers: 1. An increase of 400 per cent in capacity with the same power consumption; 2. It eliminates mixing and no attention is needed while grinding; 3. It eliminates loss of solvent by evaporation and it provides for uniform grind and color; 4. It is fairly easy to clean although throughout the industry one will find that a different mill is used for different colors.

Last in our list we have to mention a mill that has found its way into the industry in the past few years. It is the so-called speed-type mill. Where fineness of grind is no problem and where large production is desired, this mill has no equal. It is small and compact and it will deliver well over 150 gallons per hour. It is widely used in the manufacture of flat paints and industrial enamels (machinery enamels).

Fineness of Grind

NOW that we have furnished a somewhat sketchy idea of mixing and grinding, we have to discuss the matter of evaluation of fineness of grind. There are several methods which can be used to actually determine the fineness of grind. The old time method of using a palette knife to spread a small amount of paste on a smooth surface and noticing the smoothness of the path should be discredited because only a person with long experience and an extraordinary trained eye can judge what the correct grind reading is.

There are available today several gauges which will indicate accurately the degree of fineness of a paste. These gauges are all similar in design and they merely consist of a steel block and a blade. The top surface of the block is smooth and contains two parallel calibrated ground paths of identical wideness and both being tapered in depth from four to six mils in length and being calibrated accordingly.

To determine the fineness of grind of a paste, a large drop of the sample is placed in one of the paths at the deep end. Then the doctor blade is drawn over the surface of the block from the deep end of the paths to the shallow end. A tapered film will appear in the path and a reading should be made immediately by inspecting the path and noting the point where the material shows a predominantly speckled appearance. The specks should form almost a straight line at the so-called end point. It is suggested that when one is dealing with a heavy paste, this be thinned with some suitable vehicle before testing on the gauge.

This is of prime importance because when a heavy paste is drawn down on the paths of the gauge, coarse particles are kept underneath the surface of the paths, thus one can easily be misguided and obtain an erroneous reading. It is suggested also, that when one is dealing with materials requiring an exceptional fine grind, a representative sample of the paste be reduced to proper body

(*Turn to page 23*)

SAFETY in LACQUER manufacture

By C. L. JONES
Safety Engineer
Hercules Powder Co.

WHEN considering safety, it is necessary to take a broad view; that is, one must consider the safety of the personnel involved, the personnel employed in the consuming industries, the public, the property of the producing plant, and vitally important is the necessity of seeing that the financial structure of the business is safeguarded against serious loss by fire or other accident.

Some may think that there is a great difference in the fundamentals of accident prevention. There is, of course, a marked difference in the degree of hazard of one industry as compared with another, it will be agreed that the same basic principles govern the prevention of accidents in practically all industries.

All of us are aware that accident prevention is based largely on previous experience, and in any industry it is necessary to draw on that accumulated experience in planning a campaign to prevent the occurrence of accidents.

This paper was presented before N. Y. Paint and Varnish Production Club on Sept. 8, 1949 for publication in the Official Digest of the Federation of Paint and Varnish Production Clubs and is published with their permission.

The use of this accumulated experience, plus controlled imagination, plus continuous and meticulous attention to detail, is the basis for a successful accident prevention program.

Meaning of "Lacquer"

BEFORE discussing Safety in Lacquer Plants, it appears advisable to briefly discuss the meaning of the word "Lacquer." As all of you know, lacquers have been long known and used, and have been made of many materials. However, when we speak of lacquer today, we are usually thinking of those made of soluble nitrocellulose. There are others on the market, such as those made of ethyl cellulose, cellulose acetate, chlorinated rubber, and other materials; but the bulk of modern lacquers are made of nitrocellulose. Furthermore, the hazards connected with the manufacture and use of lacquers made of other materials are not substantially different than the hazards connected with lacquers made of nitrocellulose.

The risks in the lacquer manufacturing business are those connected with the storage, handing and use of nitrocellulose, flammable solvents, pigments, plasticizers, and other ingredients, and of course, the finished product.

There is a health hazard connected with the use of some lacquer ingredients, that is toxicity and dermatitis, but such hazards do not bulk very large when compared with the fire and explosion hazards, and my remarks will be directed towards a reduction in those hazards.

Nitrocellulose Problems

LET us first consider nitrocellulose. A very large quantity of nitrocellulose is produced and used each year. The exact tonnage of soluble nitrocellulose made to date is not known, but it is probably well over a billion pounds; and the accident experience in the manufacture and storage of this large quantity has been extraordinarily good. I think this excellent experience has been due to an early recognition of the various hazards existing, with the adoption of adequate safeguards.

The above refers to the experience at the producing plant. In the consuming industries, the experience has been, when all factors are considered, reasonably good, although there have been a few accidents. However, considering the quantity of nitrocellulose which is used each year, the number of accidents has been relatively small. With a wider knowledge of the necessary and desirable safeguards, it is reasonable to believe that experience in the future should continue to be good and probably should improve.

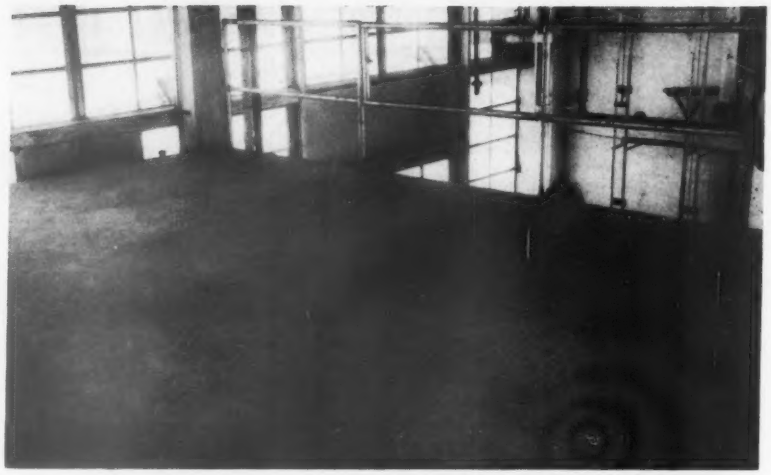
The following comparison is not made to minimize the hazards connected with the use of nitrocellulose, but is a statement of fact. Many of the accidents which have occurred in the nitrocellulose consuming industries originated with or involved flammable solvents. There is no compilation anywhere as to the exact number of accidents in the nitrocellulose consuming industries; but from our long association with and knowledge of these industries, it is believed that the majority of the accidents which have occurred can be attributed to the ignition of a vapor-air mixture in some manner or another.

Another fact, which is desirable to keep in mind, is that relatively few accidents have occurred in connection with the finished product—either in the plant of the lacquer manufacturer or in the plant of the lacquer user. However, there have been more accidents involving the use of the finished product by the lacquer consumer than in the manufacture of lacquer.

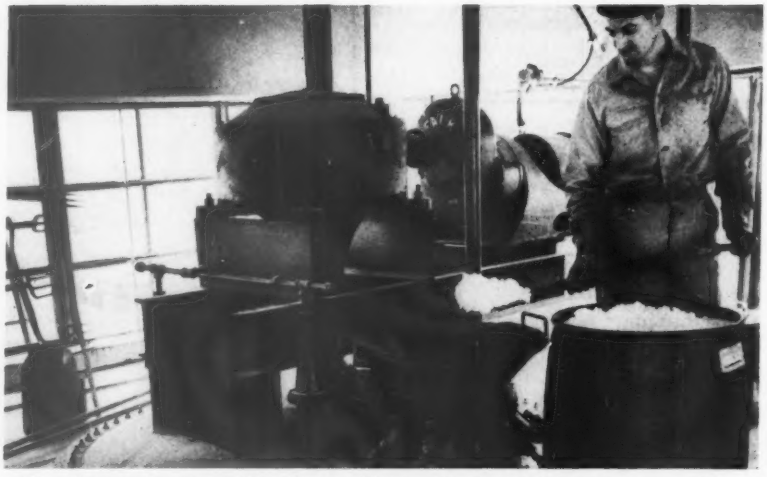
When the plant of your customer is seriously damaged or destroyed by fire or explosion, he may not be taking much of your goods for quite a while. Therefore, it is to your interest to help him prevent such losses. In this connection, during the past year several of our customers approached us because of such losses and asked that information regarding fire and accident prevention be made available for such firms. After giving the matter some thought, we got together several of the appropriate publications of the *National Board of Fire Underwriters,* and had these assembled in a bound folder, and have made these available to a number of our customers. It is hoped that the dissemination of these data to consuming industries will be helpful in preventing losses in the future. We can and are willing to supply a reasonable number of these sets of data.

Most of you are familiar with the properties of nitrocellulose. However, it will be desirable to briefly consider some of the important matters pertaining to this material.

Soluble nitrocellulose is made by the nitration of purified cellulose. While the process of manufacture is of interest, it is a rather involved one, and time will not be taken to describe the various steps.



Non-sparkling floor covering on mezzanine floor in dissolver building.



Nitrocellulose being charged into dissolver. Non-sparkling funnel is used to prevent spillage.

Barrel storage. Floor is non-sparkling and conductive. (Photos courtesy of Chemical Engineering).

Shipping and Storage

THE material as shipped is always wetted by some wetting agent, and this is usually ethyl alcohol, although the material is occasionally shipped wetted with either isopropyl alcohol or butyl alcohol, and occasionally with water.

The material so wetted is classfied by the Bureau of Explosives as an inflammable liquid, and the hazard of the material in that condition is about that of the wetting agent.

The container generally used for the packaging of nitrocellulose is the I.C.C. 6-C, which is a full open-head steel container, galvanized inside and out. The purpose in using a galvanized container is for both product quality and safety, as the galvanized finish aids in preventing iron pick-up, and such a galvanized finish is considered nonsparking.

While soluble nitrocellulose is classified as an inflammable liquid when wetted with 30% or more of wetting agent, the material becomes hazardous if permitted to dry out. When dry, it ignites easily; as a matter of fact, the dry material can be ignited by frictional heat, and it burns far more rapidly than the solvent vapor. It is, therefore, quite important to prevent the drying out of the material.

Occasionally on visits to various customer plants, we have found varying amounts of nitrocellulose stored in friction top or other containers, very dry. In this condition, the material can be dangerous; and if anyone is so storing nitrocellulose, it will be advisable upon return to your plant to inspect the contents of any such containers, and if found to be dry, to wet the material down with a suitable wetting agent. Furthermore, the practice should be adopted to avoid the storage of material in such containers either in the plant or the laboratory. If the material is obtained in such containers or if samples are taken from barrels and placed in such containers, the material should be put into solution promptly. If this cannot be done, the material should be returned to the storage.

We will now consider the storage and handling of barrels of nitrocellulose. The long, continued storage of barrels of nitrocellulose in the open and exposed to the sun's rays can cause deterioration of the quality of the material. During the winter months, ice and snow can accumulate on the barrels, making it difficult to handle them easily and safely.

Also, with open storage, foreign material such as dirt, sand, cinders, gravel, etc., can get on the barrels. Unless this material is cleaned off, it can be carried into the plant, where it may become a possible cause of accident, and may get into and contaminate the product manufactured.

Another reason for storage under cover is to protect the barrels from spark or heat if grass, rubbish, or other fire should occur near the storage location.

It is desirable to have a good distance between the storage building and exposures such as main line railroads, highways, streets, dwellings, etc. This clear space between the nitrocellulose storage building and the exposures mentioned should be of the order of 100 feet or more if it can be obtained without hardship or excessive investment.

There are many existing installations of nitrocellulose storage buildings closer than 100 feet to the exposures mentioned, and such closer spacing is not considered too objectionable. However, should a fire originate in any of the process buildings or at other locations, the heat could affect the barrels, causing a rise in pressure, thereby blowing off the lids with the possibility of burning nitrocellulose being thrown about.

A sprinkler system using a head spacing of about 50 square feet per head or less is desirable, although not absolutely necessary if there is a spacing of 100 feet or more to the exposures mentioned. If on the other hand, the spacing is somewhat less than 100 feet, it will be desirable to install sprinklers whether the building be of frame or masonry construction.

The floor of the storage building, whether it is of frame or masonry construction, should be blind-nailed if steel nails are used. If the floor is exposed nailed, the fastenings should be of copper or brass. No other material should be stored in the nitrocellulose barrel storage.

Nitrocellulose Scrap

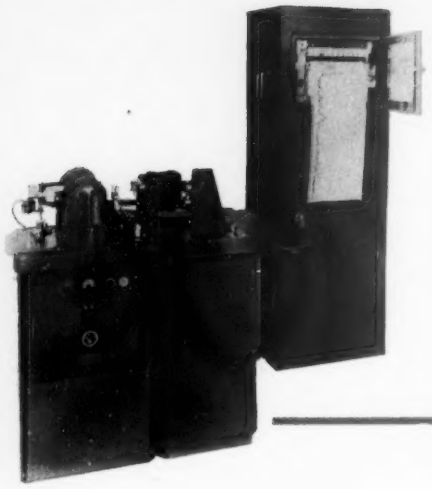
THE question may arise whether it is safe or satisfactory to store nitrocellulose film scrap in the nitrocellulose storage. Such storage is not recommended. It is suggested that such film scrap be stored in a building reserved exclusively for this purpose; this is because there is a record of a few incidents of film scrap taking fire while in storage. If such an incident should occur with a common storage, it would probably result in all of the material in the building being involved. Just recently a rather serious fire occurred at the plant of a large lacquer manufacturer. The incident is like many others in that no one can ever be sure as to the exact cause of the fire, but the evidence seems to point to the decomposition of nitrocellulose film scrap packaged in steel barrels, which in turn involved barrels of soluble nitrocellulose, solvents, diluents, solutions, etc.; and resulted in a very large loss—something in excess of $200,000.00. Had the film scrap been stored at an isolated location, in all probability this loss would not have occurred.

In some cases, nitrocellulose chips will be stored. It is desirable to store these in a non-combustible room, cut off from other storages by means of masonry or tile walls.

If practical to do so, it is recommended that barrels be stored on end and single tiered, because if they should be involved in a fire, the barrels would not leave their original location. On the other hand, if barrels are double tiered, the upper ones may be thrown quite a distance. Also, if double tiered, a large cork filled rope mat should be used to land them on when taking down.

If the barrels are to be skidded from an upper to a lower level, a wood skid should be used. If the skids are shod on the end with metal, the shoe pieces should be made of nonferrous metal, such as brass or bronze. In using such a skid, the barrel should always be under control and never allowed to bounce or roll around, and of course, this applies to any method of handling the barrels. The barrels should not be rolled or

(*Turn to page 23*)



X-RAY Diffraction Studies

ON THE PROGRESS OF GELATINIZATION IN DRYING OILS

IT HAS been planned for a long time to find possibilities of following the progress of gelatinization of oils on the diffraction x-ray instrument. Some years ago, this group made experiments in the industry, using a diffraction x-ray camera, and observed certain halos which differed in width and distance from each other, but such differences were not clear enough to establish any actual characteristics. It was, therefore, not until they began to work with the Geiger counter x-ray spectrometer that any actual results were obtained.

The instrument is based upon the fact that the distinct atomic arrangement of every substance has a diffractive effect on x-ray radiation. If a substance intercepts a fine beam of x-rays, it produces a series of emergent beams, the separation and intensities of which are characteristic of the material.

This paper was presented at the 1948 Meeting of the American Oil Chemists' Society and refers to work still under progress and development.

This investigation has been part of the paint research work conducted by the Research Division, College of Engineering, New York University for the U. S. Signal Corps Engineering Laboratories at Fort Monmouth, N. J.

This particular work was concerned with the progress of gelatinization of paint binders and drying oils. The author was assisted by Marion M. Ward, a member of this research group. X-ray tests were carried out in the laboratories of the North American Philips Co. Inc., with the active cooperation of Mr. John L. Abbott and Mr. Frederick Behr of the Philips Laboratories.

In the instrument which was used for this work, a Geiger counter tube measures the x-ray intensities and diffraction angles. These are automatically recorded on a Brown High-Speed Electronic Pontentiometer Recorder. The charts, 12 inch wide scrolls, make it possible to study the records at the convenience of the operator. Some of these charts are given here as a part of this report. The instrument was originally developed at the *Naval Research Laboratory*. The one which was used in these tests was built by the *North American Philips Company* but other similar instruments are being marketed from other sources as well.

In most of the tests, the instrument was used with 36 Kvp–6.0 ma, with Cukα radiation and Ni filter (0.0007″). In most instances especially in the test group on the insoluble substance—a 0.0005″ mica window Geiger counter tube was used and an x-ray tube slit of 0.5×2.0 mm. The Brown recorder was used with the amplitude at the

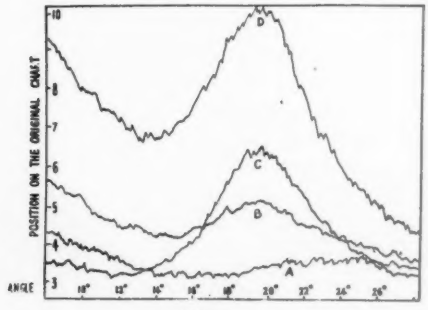


Figure 1

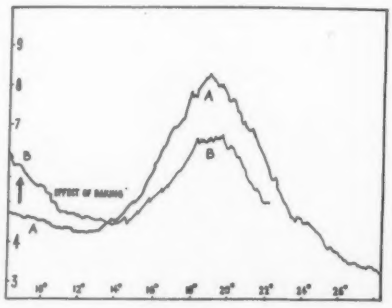


Figure 2

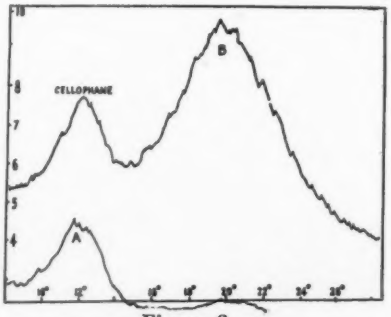


Figure 3

By DR. MAX KRONSTEIN
Research Associate,
College of Engineering
New York University

maximum and the damping at 0.8 which is approximately 4000 Ω.

Kvp—Kilo voltage at the peak.

ma—milliamperes.

Cuka—Copper target using the α radiation by filtering out the others with a nickel filter.

Ω—Ohms.

Dimensions of the slit at the Geiger tube was 0.5 mm wide × 2.0 mm high.

Subjects of Tests

IN OTHER aspects of this research project, we became interested in investigating to what extent drying, solidification or insolubilization of oils is connected with chemical or physical-chemical developments which are clearly characteristic for the dry, solidified or insoluble state.

It is evident that during the drying process of the initial liquid, soluble oil is transformed into a solid, insoluble substance. This substance then is capable of becoming swollen with suitable "swellers". It has been observed that different degrees of swelling are capable of occurring during the progress of drying. The question, therefore, arose: Are these changes indicated in the spectra of the materials also?

In the ultraviolet range, interesting shifts take place from the initial oil state to the state at which the product is no longer capable of forming soluble and stable solutions, such as are needed for the application of ultraviolet spectroscopy.

In the infrared range, the gel state is not clearly differentiated from the initial state, because there still exists some soluble products in the gelled oil, to such an extent that the soluble oil shows up in the infrared spectrum and interferes with the development of defined characteristics for the insoluble portion in the gel. This group has found ways and means of separating the insoluble substance. In the solidified state, the infrared spectrum show new characteristics on certain parts of the spectrum.

Our work is concerned with another form of spectroscopy which is quite new in oil research: Diffraction X-ray Spectroscopy, and it will be shown that the gelatinization or the progressing insolubilization of an oil changes the spectrum of the oil.

The word "oil" in this discussion refers to the esters of polyhydroxyl alcohols with fatty acids, including those which are modified by additions of other acid groups, like phthalic anhydride and maleic groups. It does not make much difference between so-called drying, semi-drying and non-drying types of these oils, since about 30 years ago *A. Kronstein*[1, 2, 3], has shown that by vacuum distillation all oils in these groups can be brought to a state of gelatinization. Therefore, in view of the fact that non-drying oils are also capable of forming gels, the findings of this investigation are not limited to so-called drying oils alone.

This present work has shown that the diffraction X-ray spectrum shows certain characteristics for the gel state itself, and it shows differences for the progress to which gelatinization or partial insolubilization has been achieved.

We at New York University are very anxious to set up, as soon as possible, the facilities for detailed studies of the subject, and we hope to do this jointly with the industry. As further detailed studies on the diffraction x-ray spectra are made, we shall report on them from time to time. However, even at this early stage of our investigation, some interesting findings can be reported.

The present report refers to

(a) Studies of films produced from oils or alkyds either on glass slides or tested without the supporting base;

(b) Studies of gelatinized oils. These were tested either after applying them, and in some instances after baking, on glass slides or by testing the skin formed in cooling a heat-formed gel, or by testing the gel itself in a small glass case with a cellophane window. (In this latter case the spectrum of the window had first been determined independently.)

(c) Studies of the insoluble portion of the oil itself.

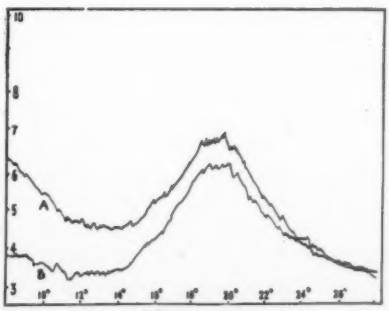


Figure 4

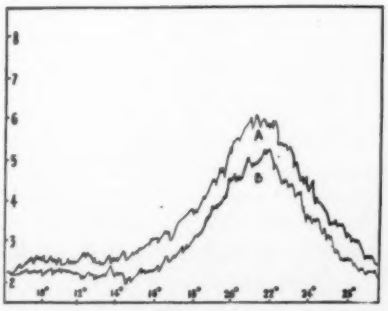


Figure 5

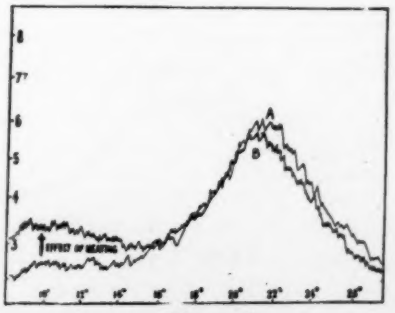


Figure 6

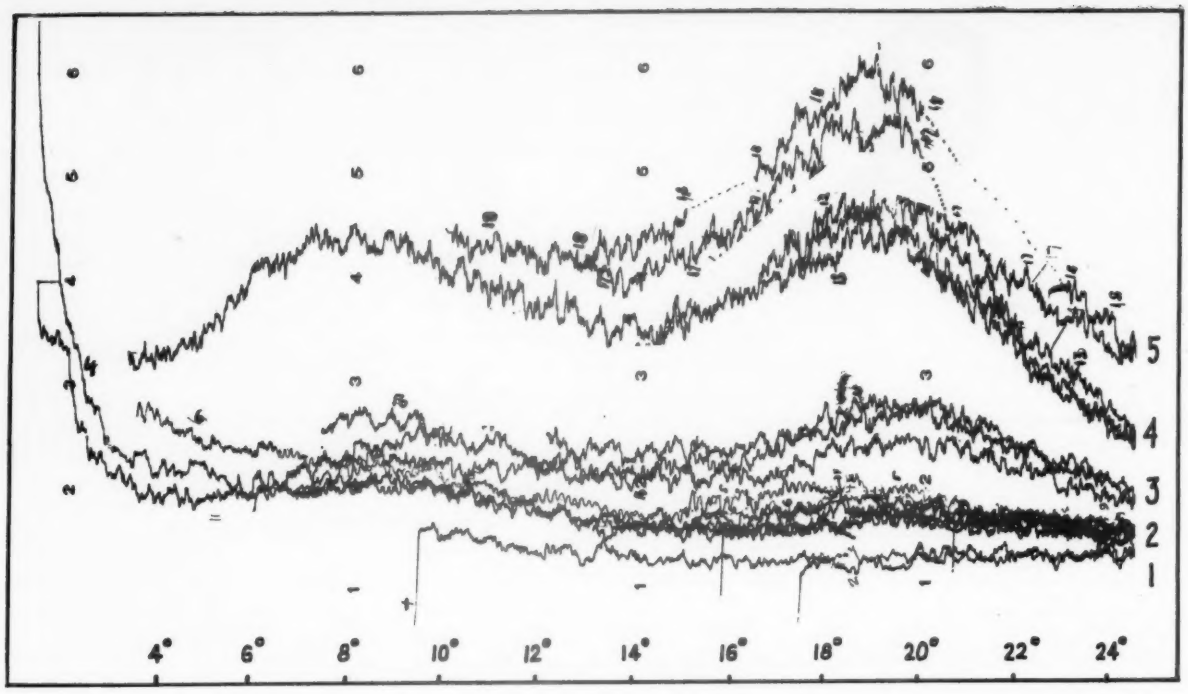


Chart 1—Graph of 18 spectra of oil and alkyd films.

The Spectra

CHART two refers to group (a) above and shows 18 different spectra of oil and alkyd films in progressive stages of insolubilization. At the right of the spectra they are classified into groups 1 to 4.

Group 1, at the bottom of the chart, refers to thin coatings of a commercial raw (Dutch Boy) linseed oil on glass slides. One sample had been heated at 55° C. for 100 hours and another at 100° C. for the same length of time. Hardly any characteristics are evident in the spectrum. These films were very thin (the 55° C. sample had a thickness of 0.001963", the 100° C. sample 0.001368").

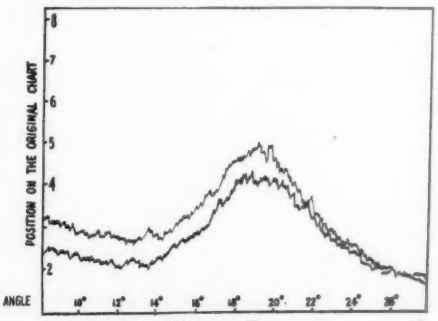


Figure 7

Group 2 shows the spectra of films produced by baking a film of bodied linseed oil (Bisbee's Z-2 oil) directly on the glass slides at 55° C. for 100 hours. Others were baked at 120° C. for 100 hours. The spectra are stronger but still not very characteristic. In this case more test work will be done as soon as possible.

Group 3 refers to coatings of alkyd resins on the glass slides, especially of an oil modified Aroplaz 1085 resin. Here we see the beginning of the development of a characteristic formation in certain parts of the spectrum. The alkyd films in this case act as some kind of fortified oil film.

Group 4 refers to films which contain insolubilized (gelatinized) oil substance. Here the profile is much sharper and is characteristic for the insolubilized state of the oils.

To further clarify the development of these profiles it can be stated that the instrument works in such a manner that the Geiger counter tube moves steadily around the test sample at a speed of rotation of one degree per minute. The x-ray intensity for each one of these different angles is recorded on the chart. With the continuous turning of the tube a continuous curve is obtained.

While various spectra have been taken over the whole 90° area by the instrument, the interesting features occur between angles of 30° and 8°. Thus, we limited our studies to this range.

There appear to be two areas of particular interest in studies of the progressing insolubilization of oils; one between 17° and 21°; the other between 6° and 10°. This corresponds with the existence of two halos in the normal diffraction x-ray photograph. Unlike the normal halos, however, the difference between the two regions is clearly apparent on the Recorder Charts.

The tests which have been completed at this time indicate that with the progress of the gelatinization of an oil, the profile of the area between 18° and 22° changes to a considerable extent, while additional

heating or baking of the gel causes chemical changes which appear in the area around 6° and 13°. This coincides with the finding that the baking of the insolubilized substance itself is connected with an additional increase of the oxygen content of the material.

Between the two peaks there appears a depression, a "valley". The height of this valley is of interest, because it appears to be less dependent on the thickness of the test sample than the starting level of the curve itself; that is the position of the curve around and above 25° or 30°.

It appears that, indeed, the difference in height between this valley and the peak of the curve increases with the increase of the insolubilization throughout the oil substance. On the other hand, it appears that the angle at which the peak of the curve appears is not—or at least not essentially—being changed during the increase in insolubilization. In the following charts the effect of the gelatinization on the position of the spectrum is clearly visible.

Gel Studies

CURVE *A* of Fig. 1 represents the spectrum of the bare glass slide, while Curve *B* represents the spectrum of a film of bodied linseed oil (Z-2) on a glass slide after baking it 20 hours at 120° C.

Curve *C* on the same table shows the spectrum of gelatinized linseed oil skin. The skin was produced by heating linseed oil (Z-2) to 300° C. until gelatinization occurred and then cooling the gel, whereby the surface skin was formed. It was used in this test two months after it had been formed.

In Figure 1 it appears that the skin sample C, which had been gelatinized at 300° C., shows a more pronounced peak in the 18°–22° region than the linseed oil film baked 20 hours at 120° C. in sample B. On the other hand, the baked sample B shows a more pronounced profile in the low angle region between 6° and 13°.

Profile D on this same fig. represents gel formed by heating bodied linseed oil to 300° C. and applying this gel as a thin film on the glass slide and baking it for 20 hours at 120° C. It has a well-defined peak in the 18°–22° region and, in contrast with the unbaked gel skin, a well-defined elevation in the second 9°–13° region.

Fig. 2 represents a parallel set of spectra from gel formation from a synthetic oil (Atlas G 875) which is an esterification of Sorbitol with linseed fatty acids. Curve *A* represents the gelatinized Sorbitol ester skin, while *B* represents the gel substance applied in a thin film on a glass slide and baked 20 hours at 120° C. Here as in the chart of the linseed oil gels, the additional baking of the gel becomes apparent in the higher peak in the low angles between 6° and 13°.

To demonstrate a method of testing the uncured gel substance itself, Fig. 3 shows the spectrum of the Atlas Sorbitol linseed fatty acid ester gelatinization product itself under a cellophane window. In this case the round-polished cavity of a microscope slide was used as a supporting base for the gel. The exposed top of the gel substance was then covered with a thin layer of cellophane. Curve *A* on this table represents the spectrum of the glass slide with the cellophane covering without the gel, Curve *B* with the gel. Here, the gel of the Sorbitol derivate has a well-developed peak in the 18°–22° region, and the spectrum of the cellophane itself remains outside of the peak area of the gel itself. Therefore, the cellophane lines can remain out of consideration in evaluating the spectrum, based on its earlier identification.

Fig. 4 shows the gels of two different oils of known composition: the Sorbitol esterification with linseed fatty acids (G875) and the Sorbitol esterification with soybean fatty acids (G876).

The G875 gel has been baked on the slide, while the G876 has been applied on the glass slide without baking. The linseed derivate has a stronger peak formation in the 19°–22° region and the effect of the baking is again seen in the lower angles similarly as in the baked samples of the other examples.

Effects of Baking

BEFORE concluding, there is at least one fact which should be mentioned about the isolated insolubilization substance of the oils. In this connection three tables are presented.

Fig. 5 shows the spectra of the solid, insoluble China Wood oil (Curve *A*) and of the solid, insoluble soybean oil (Curve *B*). Both show the well developed peak in the 18°–22° region. Since these solids have not been baked after their preparation, they show no second elevation in the lower angle section.

But by baking these solidification products after their isolation, the same shifting in the 7°–13° region is seen as is observed on the gels. This is shown in Fig. 6. Here the China Wood oil substance was again heated for 42 hours at 100° C. The effect of the baking appears in the 7°–13° region.

As a parallel to Fig. 4, a comparison is made in Fig. 7 between the spectrum of insoluble substance derived from Sorbitol with linseed fatty acids and from Sorbitol with soybean fatty acids. Both samples had been heated for 42 hours at 100° C. The similarity of the curves in the two tables is evident.

More has been done. For instance, it has been tested that in turning oil-varnish films around 90° in the sample holder of the instrument, and testing them in both positions, no trace of orientation in the oil film has been found. In stretching the film, a higher peak was observed, but no crystalline lines have been found.

This is just a beginning of the work which must be done in order to allow a final evaluation of these observations. It is hoped that arrangements can be made for completing the findings and these will be presented at a later date.

Literature References

1. A. Kronstein, *Berichte Deutsche Chemische Gesellschaft Vol. 49, p. 722 ff (1916).*
2. Charles T. O'Connor, *Varnishes from less strategic raw materials,* Chapter 5 (pp. 57–76) of J. J. Mattiello, *Protective and Decorative Coatings* (Office of the Quartermaster General) U. S. Government Printing Office, 1945.
3. D. Holde, *Kohlenwasserstoffe und Fette (Handbook) VI Ed. (Berlin 1924) pp. 574–575.*

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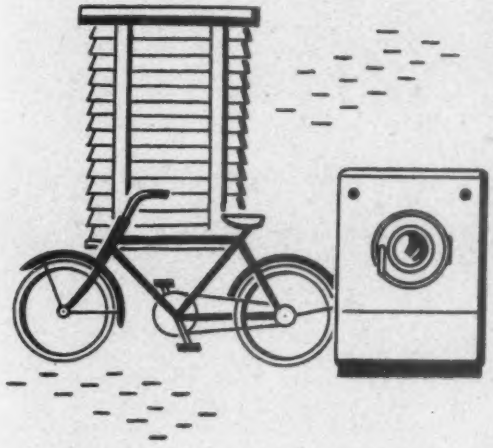

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Flame Retardant Compositions

U. S. Patent 2,480,298. William Bernard Happoldt, Jr., Arlington, N. J., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

A composition of matter comprising at least 50 per cent by weight of solid polythene, 20 per cent to 35 per cent by weight of antimony trioxide and at least 6 per cent by weight of a solid chlorinated hydrocarbon, the said chlorinated hydrocarbon containing from 55 per cent to 80 per cent by weight of chlorine; the combined weight of antimony trioxide and the said solid chlorinated hydrocarbon being present in an amount of between 38 per cent to 50 per cent by weight based on the combined weight of polythene, antimony trioxide and chlorinated hydrocarbon present in said composition and said proportions of polythene, antimony trioxide and chlorinated hydrocarbon being based on the combined weight of polythene, antimony trioxide and chlorinated hydrocarbon present in said composition.

Wrinkle Coating

U. S. Patent 2,479,298. Nathan T. Beynon, Dayton, Ohio assignor to New Wrinkle, Inc., Wilmington, Delaware.

As a new composition of matter, a wrinkle drying coating composition consisting of an uncooked homogeneous mixture of 100 parts by weight of conjugated double-bonded oil and from 10 to 50 parts by weight of polyvinyl acetate resin in the form of an aqueous emulsion.

Vacuum System for Drying

U. S. Patent 2,477,959. Joseph Mason Brown, Westfield, N. J., assignor to Worthington Pump and Machinery Corporation, Harrison, N. J.

The method of low pressure low temperature desiccation of substances which comprises maintaining a vacuum chamber at a predetermined temperature by the condensation of a refrigerant therein, subjecting the substance to be dehydrated to dehydrating action in said vacuum chamber at a temperature above the temperature corresponding to the absolute pressure in the vacuum chamber to release from the substance contained water as vapor, passing refrigerant vapor and liquid refrigerant from the vacuum chamber to a second point of condensation for condensing and residue refrigerant vapor, passing the condensed refrigerant from said second point of condensation in heat exchange relationship with the water vapor released from said substance to condense the water vapor and vaporize the vapor removed from the substance as a refrigerant, utilizing the condensed water coolant for condensing the refrigerant vapor at said second point of condensation, compressing the vaporized refrigerant and returning the compressed vaporized refrigerant to said vacuum chamber for releasing the absorbed heat of condensation of the water vapor and the heat of compression from the compressed refrigerant to provide the dehydration temperature in the vacuum chamber.

Cadmium Red Pigments

U. S. Patent 2,479,636. Ludwig F. Nerlinger, Marshallton, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

A process for producing a cadmium sulphoselenide pigment which comprises calcining in a non-oxidizing atmosphere, and at temperatures ranging from about 500–900° C., cadmium selenocyanide in the presence of added sulfur and a cadmium compound.

Titanium Oxide Pigment

U. S. Patent 2,479,637. Carl Marcus Olson, Hayden Park, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

A process for obtaining an improved rutile titanium oxide pigment exhibiting commercially satisfactory color, tinting strength and hiding power, comprising coagulating a previously peptized and monobasic acid-aged titanic acid sol obtained by peptizing and aging titanic acid at an elevated temperature in a monobasic acid, by incorporating in said sol a sufficient amount of sulfate ion-containing compound to effect coagulation thereof, purifying and washing the resulting coagulated product, incorporating a small amount of said product as a seeding material into hydrolyzable titanium sulfate solution, hydrolyzing the resulting mixture and then calcining at a temperature ranging from 750–1000° C., the recovered, purified hydrolysate to develop its pigment properties.

Phenol-Aldehyde Resins

U. S. Patent 2,479,643. George A. Senior, Jr., Bloomfield, N. J. assignor to Bakelite Corporation.

Process of preparing a resin soluble in fatty oils, which comprises reacting at an elevated temperature, until a resin solid at normal temperatures is formed, a saturated monoaldehyde free from reactive groups other than the aldehyde group and in approximately molar proportions with a monohydric phenol substitutes solely in one of the positions ortho and para to the hydroxyl group, said substituent being a radical selected from the group consisting of phenyls, cyclo-hexyls and alkyls having more than one carbon atom, in the presence of a catalytic quantity of a sulfonic acid of a phenol selected from the said group and then dehydrating the reaction mixture.

Process of Refining Glyceride Oils

U. S. Patent 2,478,089. Benjamin Clayton, Houston, Tex., assignor by mesne assignments, to Benjamin Clayton, Houston, Tex., doing business as Refining, Unincorporated.

The process of removing free fatty acids from a glyceride oil containing said fatty acids, which process comprises, forming at a temperature between 200° and 300° C, a confined flowing stream of an intimate mixture of said glyceride oil and an amount of water between approximately 1 and 4 times the amount of said free fatty acids in said glyceride oil, discharging stream into a vapor-separating chamber having a vacuum therein at a time not more than approximately 5 minutes after the forming of said mixture at said temperature as a mixture of liquid glyceride oil and water and fatty acid vapors, the time during which said water is in contact with said oil at said temperature being sufficiently short to prevent substantial hydrolysis of said oil, withdrawing said vapors from said chamber at a rate sufficient to maintain an absolute pressure therein at least as low as one-quarter inch of mercury, condensing said vapors and recovering fatty acids, and separately withdrawing liquid glyceride oil from said chamber and promptly cooling said glyceride oil.

Treatment of Drying Oils

U. S. Patent 2,478,451. Henry G. Berger, Glen Rock, and George S. Crandall and John F. Socolofsky, Woodbury, N. J. assignors to Socony-Vacuum Oil Company, Incorporated.

The process which comprises polymerizing a drying oil containing a minor proportion not in excess of about 0.2 per cent by weight of a polymerization catalyst of the Friedel-Crafts type at a temperature not substantially above about 300° F. to a body not substantially lower than Z-6 (Gardner-Holdt scale), arresting polymerization of said oil before completion of the reaction to gelation, while retaining said catalyst therein, by the addition thereto of a small quantity of an aromatic monocyclic amine.

Reversible Swing Hammer Crusher

U. S. Patent 2,478,733. Fred J. Wright, Columbus, Ohio assignor to The Jeffrey Manufacturing Company.

A grinder for reducing material including means forming a main frame, a material reducing chamber, wall means forming a side wall of said reducing chamber, pivot means supporting said wall means from said main frame for swinging movement about an axis, a power driven rotor in the bottom of said reducing chamber, material reducing elements caried by said rotor adapted to reduce material by impact and crushing, grate means carried by said wall means, said grate means including a face adapted to reduce material by impact and crushing, grate means carried by said wall means, said grate means including a face adapted to co-operate with said reducing elements for crushing material, pivot means connecting said grate means to said wall means for movement about an axis parallel to the supporting pivotal axis of the latter, a second means co-operating with said wall means supporting said grate means from said main frame for swinging movement, pivot means connecting said second means to said main frame, and pivot means connecting said grate means to said second means, all of said pivots lying on parallel axes whereby said grate means may be moved to and from said rotor thereby changing the angular position of said wall means and the position of the grate means with respect to the material reducing elements.

Manufacture of Carbon Black

U. S. Patent 2,479,708. Fred H. Amon, Weston, Mass., assignor to Godfrey L. Cabot, Inc., Boston, Mass.

The process of improving carbon black for compounding with rubber, which consists in oxidizing impingement carbon black about 750° F. for about two hours while air is admitted to the carbon black under treatment and thereby increasing its volatile content, and then devolatilizing the same carbon black by heating it at about 1200° F. for about one half hour while air is excluded therefrom.

Anticorrosive Paint

U. S. Patent 2,479,988. Francis J. Williams, Port Washington, and Edgar H. Herrmann, Brooklyn, N. Y., assignors to National Lead Company, New York, N. Y.

An anti-corrosive paint comprising in admixture, a vehicle selected from the class consisting of resinous and oleaginous film forming and drying vehicles and a plumbate of an alkaline earth metal in which at least 90% by weight of the lead is present as lead peroxide combined with an alkaline earth metal oxide.

Finishing of Pigments

U. S. Patent 2,479,836. Waller H. Holback and Winfred J. Cauwenberg, Piney River, and Walter R. Wately, Lynchburg, Va., assignors to American Cyanamid Company, New York, N. Y.

Calcined titanium dioxide pigments in the form of substantially dry powders, having an average particle size of about 0.2–0.3 micron diameter, the individual particles of said pigments carrying a coating of a non-drying water-insoluble liquid alkyd resin which is the reaction product of an organic polycarboxylic acid, a polyhydric alcohol, and a monocarboxylic acid selected from the group consisting of non-drying aliphatic and cycloaliphatic monocarboxylic acids containing from about 6 to about 26 carbon atoms in an amount within the range of 0.25% to 5% based on the weight of the pigment.

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Water-Dispersible TiO_2

U. S. Patent 2,480,092. Walter R. Whately, Lynchburg, Va., assignor to American Cyanamid Company, New York, N. Y.

In a process for the production of water-dispersible titanium dioxide pigments, the step comprising the flocculation of water-dispersed hydroclassified micropulverized calcined titanium dioxide by the addition thereto of a small amount not greater than 2%, based on the weight of the calcined titanium dioxide, of a hydrolyzable titanium salt.

Cashew Oil Separation

U. S. Patent 2,480,221. Solomon Caplan, New York, N. Y., assignor to The Harvel Corporation, a corporation of New Jersey.

The method comprising to a combination of cashew nut shell liquid and cashew kernel oil adding a quantity of an alcohol selected from the group consisting of methyl alcohol, ethyl alcohol and isopropyl alcohol to selectively dissolve said cashew nut shell liquid and then separating said cashew kernel oil from said solution of cashew nut shell liquid in said alcohol.

Vinyldiacetonalkamine

U. S. Patent 2,480,329. Ernst H. Kastning, Mamaroneck, and Carl F. Lischer, Larchmont, N. Y., assignors to William R. Warner & Co., Inc.

A process for the manufacture from vinyldiacetonamine of a product consisting substantially of the form of vinyldiacetonalkamine melting at approximately 162° C. which consists in subjecting the vinyldiacetonamine to hydrogenation in the presence of a nickel catalyst at a temperature below 180° C. and recovering the sole reaction product consisting substantially of vinyldiacetonealkamine melting at approximately 162° C.

Drying Oils

U. S. Patent 2,479,857 Latimer D. Myers, Cincinnati, Ohio and James W. Ritz, Bergenfield, N. J., assignors to Emery Industries, Inc., Cincinnati, Ohio.

The method of removing non-drying fatty acids from a fatty oil of the class consisting of drying and semi-drying oils, to improve the drying properties thereof, said method comprising heating the oil with a polymer of fatty acids having, before their polymerization, the same number of carbon atoms per molecule as the non-drying fatty acids which are desired to be removed from the said oil, and then distilling from the said oil non-drying fatty acids which have been liberated by the said polymer acids.

Process for Making Bodied Oils

U. S. Patent 2,480,485. Willy Lange, Cincinnati, and Robert G. Folzenlogen, Golf Manor, Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio.

The process of producing a boron trifluoride bodied oil, characterized by rapid drying rate, improved color and freedom from crystallization at normal room temperature, which comprises heating an unsaturated fatty oil in the absence of a polymerization catalyst at a temperature from about 250° C. to about 350° C. for a brief period to effect rearrangement of fatty acid radicals in said oil and to inactivate substances in the oil reactive with boron trifluoride to form salts which in secondary reactions yield water-stable compounds with pigmentary value, without effecting substantial heat bodying and substantial reduction in the iodine value of the oil, and thereafter bodying the heat treated oil at lower temperature in the presence of a small amount of boron trifluoride until the desired degree of bodying is attained.

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. . . LACQUER MANUFACTURE

(*From page 13*)

slid on concrete, steel, gravel, cinders, or other surfaces from which sparks may be struck.

The reason for this precaution can be illustrated by an accident which occurred several years ago at the plant of one of the lacquer manufacturers. In this incident, barrels were being skidded down a permanent concrete ramp, having a grade of about 15%. Exactly what happened will never be known, but the contents of a barrel were fired—either from frictional heat being transmitted through the wall of the barrel or the barrel was a leaker and struck a spark which ingited the alcohol-air vapor mixture. In any event, the material in the barrel started to burn, and as pressure built up, the head was blown off after the barrel had reached the lower floor, causing burning nitrocellulose to be thrown out. This involved two men, and the burns which they suffered caused death. The property loss in this incident was rather moderate, amounting to only a few thousand dollars.

It had long been the practice at this particular plant to skid such barrels down the ramp, and prior to this accident, no trouble had occurred.

For the movement of the barrels from the nitrocellulose storage to the nitrocellulose dissolving room or other points of use, it is suggested that a concrete or other suitable walk pavement be placed, and that the barrels be transported by means of a hand truck. This truck should be one of the self-loading types with a finger or grab at the top made of a non-sparking metal such as phosphor or tobin bronze. The wheels of the truck should be of the nonsparking and conductive type. Rubber tired wheels should be avoided, as they would act as an insulator.

Large wall placards are available, listing the various safeguards which should be observed in the storage, handling, and use of nitrocellulose.

Operating Practices

BEFORE bringing the barrels of nitrocellulose into the manufacturing building, the exterior surface of the barrels should be cleaned of any foreign material. If sand, cinders, or other foreign material is brought into the operating building, there is the possibility that such contaminants may cause a spark and result in the firing of vapor or of dried particles of nitrocellulose. Furthermore, such contaminants may get into the product and affect its quality.

The number of barrels of nitrocellulose brought into or near the manufacturing building should be kept at a minimum, because the more material, the more serious the fire if such a thing should occur.

Barrels should not be opened until charging is ready to commence. In some cases where part barrels are used, it may be necessary to keep in the manufacturing building a few such part barrels for a matter of days. This ought to be avoided if it is practical to do so. The barrels should be brought in the building, the required quantity weighed out, the barrel properly closed, and returned to storage within a reasonable time. This is not always practical, and in some cases, it is necessary to keep part of the barrels in the manufacturing buildings. However, they should be properly resealed, and it will be desirable to place them at a location where they can be protected by more than an ordinary concentration of sprinkler heads. In other words, supply one-half dozen part barrels with one-half dozen sprinkler heads, so that in the event of fire, there would be the discharge of a lot of water, which should quickly control a fire.

For opening the barrels, a non-sparking speed wrench should be used. For digging the material from the barrels, a non-sparking fork should be used. For transferring from the barrels to other containers or mixers, a non-sparking scoop should be used. If nitrocellulose is transferred into another container, prior to charging into a dissolver, such a container should also be made of a non-sparking material.

The platform of the scale used for weighing either barrels or other containers being filled with nitrocellulose should have a non-sparking surface. Also, the wheels of this scale, if it is a portable one, should be non-sparking, and conductive. These measures are to minimize the struck spark and static hazards.

In addition to the non-sparking tools mentioned above, all other tools regularly used in the lacquer plant, such as wrenches, hammers, chisels, etc., should be made of nonsparking metal. While such tools are not as satisfactory as ones made of steel, they do a reasonably good job, and their use minimizes the struck spark hazard.

If nitrocellulose is spilled during the charging operation, it should be picked up at once and disposed of. If it is not contaminated, the simplest way to dispose of it is to put it in the dissolver. If contaminated, it ought to be placed in a pail or can containing water. At the end of that day or shift, such scrap nitrocellulose should be taken to a safe place for disposal. Probably the safest disposal is by burning in the open at a so-called burning ground. The water should be wrung out of the scrap nitrocellulose by hand, and the material placed on paper or other combustible, and the latter fired. Under no circumstances should nitrocellulose be burned in a boiler fire box or other confined locations.

. . . MIXING AND GRINDING

(*From page 10*)

and applied according to specifications. By inspecting the finished product one will be able to get an accurate and permanent indication of the fineness of grind and consequently of mill performance.

Mixing and grinding present such a multiplicity of aspects that the above is but a brief analysis of some of the problems which will have to be faced by all paint manufacturers. It appears, therefore, that a proper study of grinding proportions which is a "must" for an excellent and efficient grind, and rigid control of fineness of grind will contribute to give a finished product that will meet all required specifications.

•

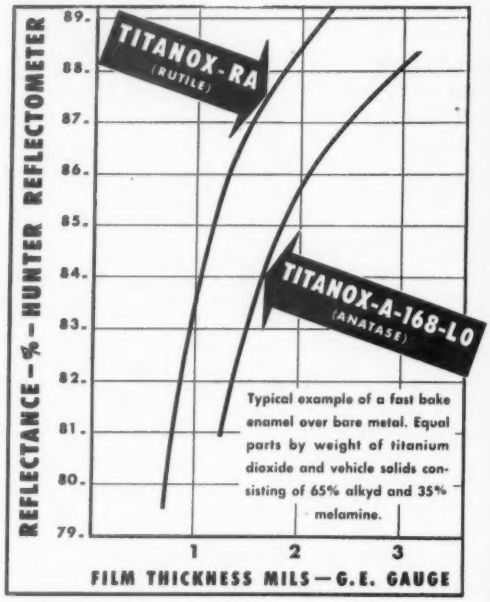
Michael S. Quaid Dies

Michael S. Quaid, chief chemist of the Benjamin Moore Co. died recently at the New England Baptist Hospital in Boston.

Technical Tips from Titanox

Q. how much reflectance can you get in a coating?

A. as much as you require.



Getting high reflectance in a single thin coat of reflector enamel baked over bare metal can prove to be a difficult problem. But note in the case charted above how easily this requirement, even at low film thickness, is achieved with TITANOX-RA (rutile titanium dioxide). Also, note how much more reflectance the rutile type imparts than the anatase type TITANOX-A-168-LO.

Surplus brightness contributed by the rutile pigment leaves enough reflectance after toning with blue or violet to achieve attractive whiteness. Thus the use of anatase pigment is generally not warranted.

Because of the remarkable brightening power of TITANOX-RA, a small proportion of dark pigment may be used with it to assure the utmost in hiding power at a given brightness. These qualities are also exhibited by the composite rutile pigment TITANOX-RCHT (30% rutile TiO_2; 70% $CaSO_4$).

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NEW RESIN

Fast Drying

Enamel finishes that air-dry as fast as lacquers can be formulated from Bakelite "C-10" Resin BJS-502, according to the manufacturer. These resins are now being used for toys and farm implements where it is an advantage to be able to handle such items 8 to 10 minutes after spray application.

It is also claimed that baking-type enamels based on BJS-502 offer great usefulness in meeting short baking cycles. For example, these enamels will bake to a Walker-Steele hardness of 137 seconds in 30 minutes at 250 degrees F. At 300 degrees F such enamels bake to 141 seconds in 20 minutes. Bakelite Corp., 30 E. 42nd St., New York, N. Y. PVP October.

OCTOIC DRIERS

Light Color

Octoic driers, metallic soap solutions in a petroleum solvent, are made from 2-ethyl hexoic acid, which is also known as octoic acid. According to the manufacturer, these driers offer the following properties: Light in color, viscosity less than A on the Gardner-Holdt Scale, good stability, no precipitation or sludging; good compatibility and solubility, the driers being easily dispersible with oils, varnishes, and resin solutions. Witco Chemical Co., 47 Ann St., New York 7, N. Y. PVP —October.

GAS DETECTOR

Underwriters' Approval

Combustible gas detector is said to have been approved by the Underwriters' Laboratories. Unit is now available to industries where combustible gas mixtures are apt to be present. According to the manufacturer, this instrument utilizes a number of remote gas analysis cells piped up to a central air-tight control cabinet. The remote head instantly records a dangerous condition to the control panel, which operates audible and visible alarms. Lor-Ann Instrument Co., 58 Montgomery St., Jersey City, N. J. PVP—October.

DRUM CONVEYING SYSTEM

Gravity and Roller

Apron, gravity and live roller conveyor system makes for handling of drums from filling to storage points. The system utilizes air-actuated deflectors to control movement of drums on the converging conveyor line. According to the manufacturer, the flow along any line is halted momentarily and there are no pile-ups or delays.

The drums proceed from filling points down gravity roller conveyors. An automatic brake and an end stop control the release of the drums from the gravity roller conveyor onto the main apron conveyor line. Alvey-Ferguson Co., 62 Disney St., Cincinnati 8, Ohio. PVP—October.

ROTATIONAL VISCOMETER

Simpler to operate

The Interchemical Rotational Viscometer has been redesigned so that all operating parts are contained in one housing. The housing table top contains controls and dials within easy reach of the operator, and according to the manufacturer, makes the apparatus simpler to manipulate. The viscometer will give data on the flow properties of paints, inks and plastics.

It consists essentially of rotating sample cup and a stationary bob immersed in it. When the cup is rotated the drag on the bob caused by the liquid is imposed on a coiled spring which is twisted through an angle measured on a calibrated disk. The rotational speed can be varied from 10 to 40 r. p. m.

The consistency curve is produced by changing the speeds over a series of steps from low to high, and back again, and noting the deflections on the calibrated disk. Precision Scientific Company, 3737 W. Cortland Street, Chicago 47, Ill. PVP October.

OXIDIZING RESIN

Trade-Sales Enamel

Development of a new low-viscosity oxidizing type resin to supply easy brushing, fast drying, good color and gloss for enamels and similar coatings is available.

The phthalic alkyd resin, identified as Duraplex C-57, was designed, according to the manufacturer, as a vehicle for production of general purpose syndicate enamels, household brushing coatings and toy refinishing enamels. It is said to meet also the strict requirements for coating agricultural implements, and for enamels for re-coating such equipment. Further claims are that it possesses marked advantages in metal decorating enamels, where it bakes very rapidly to a tack-free film, exhibits good flow, leveling and hot-slip characteristics and shows retention of color and gloss.

Investigations by the manufacturer show its usefulness in blends with Duraplex C-55 for automotive refinishing enamels, and that an addition of 25 per cent of the new resin to a Duraplex C-55 enamel raises the solids content and results in a fuller, glossier film. Resinous Products Div. of Rohm & Haas Co., Philadelphia, Pa. PVP—October.

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Cleveland	**Cherry 5943**	**New York**	**Whitehall 4-0800**
Detroit	**Vinewood 2-2500**	**Philadelphia**	**Jefferson 3-3000**
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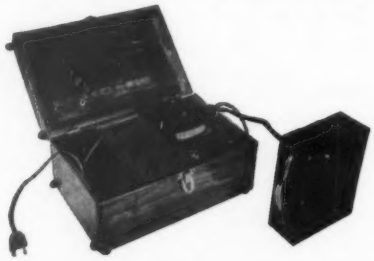

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NEW PRODUCTS

PLIOLITE RESIN

Pellet Form

An improved manufacturing process resulting in a new form of Pliolite S-5 resin for paint manufacturers at reduction in price has been announced by this firm.

Offered in a new porous pellet form, Pliolite S-5, a high styrene copolymer is used in concrete enamels, chemically-resistant coatings, plaster sealers, stucco finishes, aluminum vehicles and traffic marking paints.

According to the manufacturer, this resin has the desirable solubility characteristics of a powdered resin without dusting during handling or floating during dissolution. Goodyear Tire and Rubber Co., Chemical Div., Akron, Ohio. PVP October.

PROPELLER MIXTURE

Insures Balance

Belt-driven portable mixer, features arrangement of propeller shaft and motor, which is claimed to insure inherent balance of the assembly on the tank edge. The mixer is so constructed that the centers of gravity of both mixer and motor are below the support point, so that only little pressure is necessary to hold the unit in place. Interchangeable belts and pulleys are available for speed changes. Shaft lengths can be changed to take care of deeper or shallower tank. They are available in stainless steel, aluminum, bronze, iron and monel metal, sizes up to 3 h.p. The United States Motor Co. 178 Centre Street, New York 13, N. Y. PVP—October.

WEIGHT DETERMINATOR

Uses Freezing Point

A self-contained apparatus is being offered to laboratories for determining the molecular weight of chemicals, and freezing points of liquids. It is claimed that the unit is simple to operate, requiring only the addition of ice to the Dewar flask of the unit and plugging into 115-volt line. Cryoscopic molecular weight apparatus determines molecular weight by the freezing point method. Operator first determines the freezing point of an accurately weighed amount of liquid whose molecular weight is known. Then a definite amount of material of unknown weight is dissolved in this liquid, and the lowering temperature is directly proportional to the molecular weight. Precision Scientific Co., 3737 W. Cortland St., Chicago 47, Ill. PVP—October.

SOYA ALKYD

Automotive Coatings and Primers

The Plaskon Division is now offering Plaskon 3161 solution for use in the formulation of automotive coatings and primers, appliance finishes and general-purpose industrial baking primers. It may be employed with 10–25% urea or 5–15% melamine resins in such formulations.

Plaskon 3161 is a short-soya alkyd resin in Solvesso 100. The solution contains 50% solids, has color under 6 (IP and VR), acid number 12–14, GH viscosity of V-X, wt. per gallon 8.24 lbs.

According to the manufacturer, this resin features excellent color retention, fast drying, short baking cycles, and may be used to produce finishes of excellent weather resistance, with tough films when cured. Plaskon Div., Libbey-Owens—Ford Glass Co., Toledo, Ohio. PVP October.

TITANIUM PIGMENT

Low Reactivity with Vehicles

Several improved types of titanium dioxide are being manufactured and are standardized for distribution by the American Cyanamid Co. The improvements are a result of development work and the introduction of new processing equipment. Unitane 0-310 (anatase type) is particularly suited for high temperature baking enamels, refrigerator finishes, lacquers, and phenolic enamels. It is characterized by low reactivity with most vehicles, according to the manufacturer.

Unitane OR-342 was developed especially for use in enamel finishes and related products. It is said to be particularly adapted to formulas including more reactive vehicles such as the maleic modified types and certain highly bodied oleoresinous varnishes.

Unitane OR-342 is claimed to perform well in metal decorative roller coatings where thin films are laid down and must have the maximum flow to give satisfactory coverage and uniformity. American Cyanamid Co., Calco Chemical Div., Bound Brook, N. J. PVP October.

ADJUSTABLE RAMP

Portable, Safe

Adjustable ramp provides easy and speedy unloading of drums from truck bed to street level, truck to truck, freight car to truck, etc. It is said that this ramp eliminates hazards which cause injuries to men and damage to goods. A mechanical screw-type lifting gear provides a 12 inch variation in height at one end of the ramp. The wheels of the ramp may be retracted by cranking to clear the ground. Sizes 5′ wide, 14′ long; capacity of 6,000 lbs. also 10′ lengths. Minimum height adjustable end is 41″; maximum raised is 53″. Barrett-Cravens Co., 4609 S. Western Blvd., Chicago 9, Ill. PVP—October.

Mechanical screw type adjustable ramp

N. Y. U. Paint Symposium

The second annual varnish and paint chemistry symposium will be held at the New York University College of Engineering, late in November it was recently announced by Dean Thorndike Saville.

Jointly sponsored by the College of Engineering, the New York Paint and Varnish Production Club, and the New York Paint, Varnish and Lacquer Association, the one-day session, has been tentatively scheduled for November 19 or November 26, depending on the wishes of those who will attend. Dr. Max Kronstein, adjunct associate professor of Chemical Engineering, will conduct the all-day meeting.

At last year's initial symposium French, English and United States representatives featured papers on: research and test methods, photography of surface details, infrared spectroscopy, protective coatings, adhesion, drying oils, and electrical insulating varnishes. A similar program is planned for this session and the details will be announced at a later date.

Those interested in attending the symposium should contact Dr. Max Kronstein, New York University College of Engineering, University Heights, New York 53, New York.

•

Dow Moves Laboratory

The Industrial Application Laboratory of the Dow Chemical Co. has moved from Ann Arbor, Mich, to new and larger quarters in Bay City, Mich.

Laboratory director Dr. O. C. Cessna his assistant, Edward O. Ohlmann and six other key employees made the shift, while several technicians will be added to bring the staff up to its normal complement.

The new location affords some 10,000 sq. feet of floor space, approximately four times that formerly available, and will permit more effective operation and the use of larger scale equipment.

This laboratory is concerned with work on the industrial application of Dow products.

•

Charles L. Gabriel Dies

Charles L. Gabriel, vice-president in charge of chemical research for Publicker Industries, Inc., died recently in Atlantic City.

Mr. Gabriel was born in New York City, and was graduated from Massachusetts Institute of Technology in 1913 where he received his Master of Science degree. During World War I he was a first lieutenant in chemical warfare service, and was commended by Major General W. L. Seibert, then chief of the service.

Mr. Gabriel was quite active in the paint technological field, having written several technical articles, and having held several patents on improvements of lacquer compositions and synthetic resin varnishes. He joined Publicker Industries in 1931, and became vice president in 1942.

He was a member of the American Chemical Society, the American Institute of Chemists, American Institute of Industrial Engineers, and the Franklin Institute.

•

Vinyl Baked Enamel

The Interchemical Company of Newark, N. J. has recently developed a baking enamel which contains vinyl chloride as one of the principal ingredients. This enamel is used for protecting and decorating metals. The finish is applied by cold spraying and cured between 325–350 degrees F.

According to the announcement, the outstanding properties of this finish are its abrasion and chemical resistance, but of particular importance is its unusual toughness under strains and stresses. This was demonstrated, manufacturer claims, in its application to aluminum and other sheet metal surfaces, which are drawn at rates up to 120 units per hour by the Marform process of metal forming, a development of the Glenn L. Martin Co. of Baltimore.

In search for an enamel, which would not crack in this process, the Interchemical Corp. was consulted. After many months of collaboration with engineers of both companies, this finish was produced and tested for the process.

•

Copper Fungicide

Engineer Research and Development Laboratories of Fort Belvoir, Va., has developed a new copper fungicide for incorporation in paints and protective coatings. Copper quinolinolate is the chemical.

Discovery of this new family of versatile fungicides comes as the climax of 6 years of research and was designed to develop a paint that would protect the Army's equipment in tropical areas. This fungicide is yellow-green in color, and can be used in its original form as part of the pigment in paints.

During the EROL tests, common "red Barn" paint containing copper quinolinolate and a control sample of the same paint containing no fungicide were exposed on identical wood slabs for a period of three months to the ravages of heat, moisture and fungus-laden air in a tropical testing chamber.

At the conclusion of the test, the treated sample showed no visible deterioration. By contrast, the control sample of paint showed more than 95% destruction with heavy fungus attack.

•

General Mills Promotes Wheeler

Dr. D. H. Wheeler has been promoted to Director of Technical Sales and Service of the Chemical Division of General Mills Inc. In his new position Dr. Wheeler will be responsible for all Technical Sales Service of this Division and spend a considerable portion of his time in this field calling on the trade.

Dr. Wheeler joined General Mills in 1943 and has been head of the Chemical Research Department where he had complete charge of all organic chemistry research. This included the development of drying oils, fatty acids, synthetic wax and soybean products. Prior to his connection with General Mills Dr. Wheeler had four years service as senior chemist with the United States Department of Agriculture Research Laboratories in Peoria, Ill.

In February 1947 he was named one of the nation's ablest fat and oils chemists in a survey sponsored by the Chicago section of the American Chemical Society.

•

Fellowship Awards

Two recent college graduates have been awarded graduate fellowships at Illinois Institute of Technology offered jointly by the Chicago Paint, Varnish and Lacquer Association and the Chicago Paint and Varnish Production Club, it was announced recently by William A. Lewis, dean of the Graduate school. They are:

William G. Morrison, 302 South Military street, Lawrenceburg, Tenn., who received his B.S. in chemical engineering from Vanderbilt University in June.

George T. Mattson, 1211 30th Avenue N., Minneapolis, Minnesota, who received his B.S. in chemical engineering from Illinois Tech in June.

Since both men are veterans and eligible for benefits under the G.I. bill of rights, the award of $1,000 and tuition for two semesters was divided.

Starting in September, the two will begin work leading to the degree of master of science in chemical engineering and will also conduct a research project on a fundamental topic of interest to the protective coatings industry.

Branch Named Dow Manager

C. Benson Branch of the plastics division of the Dow Chemical Company has been named manager of the company's technical service and development division, it was announced recently. He joined the company in 1937. Before his latest appointment he had been in charge of the coatings and raw materials section of the company's plastics division.

•

Reichhold Expands in Europe

In a recent announcement, Henry R. Reichhold owner of Reichhold Chemicals, Inc., Detroit has told of the company's plan for expanding their European facilities to supply paint manufacturers of Europe.

Reichhold resins will be manufactured by Kunstharsfabrich Synthese, N. V., Sassenheim, Holland.

These will meet the same rigid specification and performance standards as those manufactured in this country.

Air Force Paint Remover

The Air Materiel command at Wright-Patterson field has developed a chemical combination which will remove highly resistant aircraft camouflage enamels. Surfaces sprayed with the new solution comes nearly 100 percent clean, whereas paint removers conforming to earlier Air Force specifications leave 8–10 percent of the paint. Moreover, it remains stable in storage up to six months, is non-corrosive, is a smooth mixture and washes off easily under high-pressure water. It is believed that this remover will prove very successful in high-speed methods for many industrial processes. The Air Force found it could remove camouflage enamels from the giant C-47 in half a day.

The basic formula is:

Methylene Chloride (commercial grade)	76.5%	by	weight
Methyl Alcohol	6.5	"	"
Cellosolve	4.0	"	"
Methyl Cellulose (medium viscosity)	2.0	"	"
Wetting agent (sodium petroleum sulfonate)	5.0	"	"
Paraffin Wax	3.0	"	"
Water	3.0	"	"

Report PB–97658 covering detailed information this remover is available at the Office of Technical Services, U. S. Dept. of Commerce, Washington for $1.75.

•

Tin Restrictions End

The Commerce Department has recently ordered sweeping elimination of tin use restrictions which were in effect since the early war days.

Conservation Order M–81, covering the specifications in can manufacture was ordered revoked effective December 1 and M–43 was eliminated to provide for relative free tin importation by private business effective immediately, and amendment of closure restriction to become effective December 1.

•

John Marshall Dies

John Marshall of the E. I. DuPont de Nemours & Co. died recently at his home after six months of illness. He was 58 years old.

Mr. Marshall was director of the DuPont's Chemical Division in the Fabric and Finishes Department. From 1927 to 1933 he was research director at the company's Paint Research Laboratory in Philadelphia. The company has named its new Philadelphia laboratory, which is presently under construction, in his honor.

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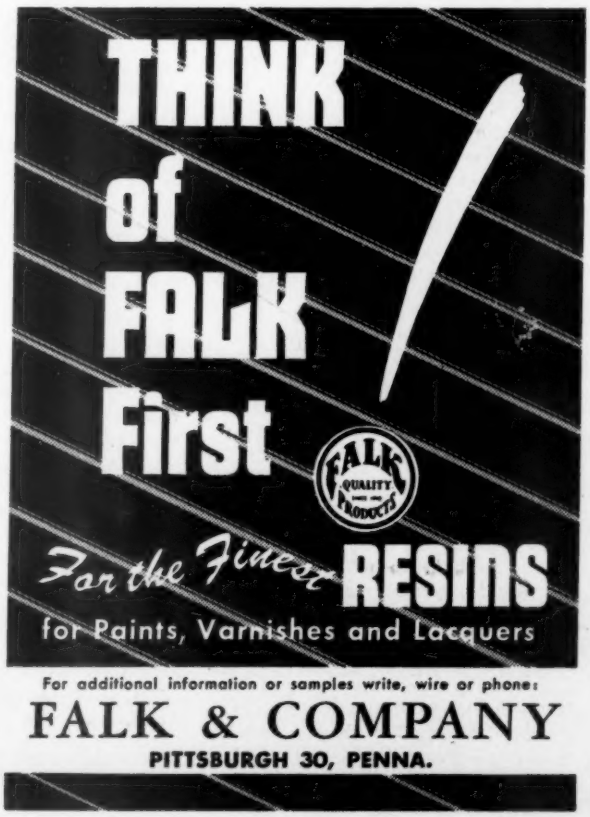


Herberger Joins Atlas

Philip Herberger has been appointed senior lacquer chemist at the Stanford, Conn. branch of Atlas Powder Co. He was formerly with the R. L. Evans Associates in New York City.

•

McDougall-Butler Names Schleicher

The McDougall-Bulter Co. has announced the appointment of Martin E. Schleicher as technical director. He succeeds John F. Willis who resigned recently.

Mr. Schleicher has been connected with McDougall-Bulter since 1944, and prior to his promotion to technical director served as chief chemist. Mr. Schleicher is a graduate of the School of Science and Technology of Pratt Institute where he took courses in protective coatings and paint technology.

•

Brasington Named Vickers Agent

The Brasington Corp. of Cincinnati, manufacturers of grinding and mixing equipment have announced their affiliation with Vickers-Armstrongs, Ltd., British manufacturers of Keenok wet milling and mixing equipment in the engineering, servicing, and sale of this equipment as Vickers U. S. A. agent. Plans have been completed for the stocking of complete machines and parts for this equipment in the United States.

Cole & DeGraf of San Francisco has been named Brasington's western representative and will handle a complete line of both Brasington and Keenok machines.

•

New Monsanto Intermediate

Monsanto Chemical Company of St. Louis announced recently the development of a new chemical, a product of the activities of the Central Research Department of the company, to a group of nine university professors attending Monsanto's Two-Way Street Conference in Dayton.

Dr. Carroll A. Hochwalt, a Monsanto vice president and director, said the new chemical was a high molecular weight alcohol. It has been given the temporary name "AE-1" until an appropriate trade name can be found. He described it as having wide-spread potentialities as a chemical intermediate having uses in resins, protective coatings, and oil additives.

Dr. Hochwalt, who is in charge of coordination of Monsanto's research, development and patent activity, told the visiting professors that the development of this new product was indicative of the work that is carried on regularly by the Central Research Department in Dayton. The research performed here, he said, is more fundamental and general than the work carried on by the research departments of Monsanto's six operating divisions. Although AE-1 was born in the laboratories at Dayton, it will be reared by the sales development department of the company's Phosphate Division at St. Louis.

According to Dr. Hochwalt, it may be used as a plasticizer, and recommended it as being compatible with nitrocellulose and other cellulosic derivatives, as well as a plasticizer for chlorinated rubber; in the protective coating field, it was recommended for applications in lacquers, varnishes and as a pigment dispersant.

Monsanto's Phosphate Division has issued Technical Bulletin P140 describing this new product.

•

Proposed Federal Specifications

A preliminary draft dated September 7th, covering Proposed Revision of Federal Specifications, TT-P-53, TT-P-59, TT-P-146, has been released by E. F. Hickson, chairman of the Technical Committee on Paint, Varnish, Lacquer, and Related Materials, Federal Specifications Board.

TT-P-53 covers specifications for Paint, outside, Ready-mixed, Medium-chrome-yellow.

TT-P-59 covers specifications on Paint, Ready-mixed International Orange.

TT-P-146 covers specifications on Paint, Varnish-Base. (For concrete and wood floors)

The main purpose in revising these present specifications is to bring them up to date.

•

Construction Work Begins On DuPont Finishes Laboratory

Construction work has started in Philadelphia on the Marshall Laboratory of the DuPont Co., named in honor of the late John Marshall, former director of the Chemical Division of the Fabric and Finishes Department. Scheduled to be completed late next year at a cost of $2,000,000, the new four-story building will replace laboratory facilities now located in three different buildings on the grounds of the DuPont finishes plant in Philadelphia.

•

G-E to Serve Midwest

The General Electric Company has established a warehouse at Decatur, Ill. for the purpose of serving users of this area with G-E Glyptal alkyd resins.

Floor Paint Specifications

New specifications covering finishes for hardwood floors have been issued for the Maple Flooring Manufacturers' Association by Foster D. Snell, Inc., New York chemical consulting firm and official laboratory for the Association.

The 1949 specifications amend and supersede those issued in 1946. They establish standards for finishes for both heavy duty and gymnasium floors and are designed to give users of these products the benefit of technological improvements in the intervening years.

Principal changes from previous specifications included in the present ones establish numerical values for several text properties left indefinite previously. Toughness is defined by a Kauri reduction text; minimum abrasion resistance for heavy duty finishes is set at an index number of 150 by Taber abraser (250 for gymnasium finishes); color must be not darker than No. 13 by Gardner Color Standard; Sward Hardness of the film must be at least 24; maximum viscosity is specified at A2 on the Gardner scale, (C for gymnasium finishes); and a new text covers resistance to alcohol and naptha.

Copies of the specifications can be had by those interested from Foster D. Snell, Inc., 29 West 15th Street, New York 11, N. Y., or from the Maple Flooring Manufacturers' Association, 46 Washington Boulevard, Oshkosh, Wis.

•

DuPont Names Holbrook Assistant Director

Dr. George E. Holbrook has been named assistant director of the technical division of the DuPont Organic Chemical Dept. Prior to this appointment, Dr. Holbrook was general superintendent of development at the Chambers Works at Deepwater Point, N. J.

•

German Chemical Industry

The German Chemical industry has recovered rapidly during the last few years, but will not lead the world again in the volume production of chemicals, according to Dr. Emil Ott, director of research of the Hercules Powder Company. Dr. Ott has recently returned from a two months' European trip.

Leadership in chemicals went to the United States during World War II, he explained, adding that Germany can and is taking its place as an important supplier of specialty chemicals.

Visits to industrial laboratories in Germany, Switzerland, Belgium and Holland have convinced him that the European chemists are again in position to make significant contributions to the industry.

TECHNICAL Bulletins

LIQUID WEIGHING BULLETIN

This bulletin discusses hydrostatic gauges in twelve pages. It discusses gauges as offering accurate, continuous measurement of any liquid, with scale calibrated in units of volume, depth or weight. It also states that accuracy within 0.25% is possible if calibration is made with measured or weighed quantities of liquid. This bulletin, G-101, is issued by King Engineering Corp., Ann Arbor, Michigan.

SOYBEAN BOOKLET

A twenty-page booklet, entitled "Cracking the Soybean", discusses the end use of soybean oil. It emphasizes trends in research and points out the accomplishment of past research programs, technical progress over the past 30 years and discusses the conditions then and now as regards uses of soybean.

Of particular interest to those engaged in the manufacturing of paints, varnishes and lacquers is the discussion on the use of soybean oils in these products. This booklet is issued by Archer-Daniels-Midland Co., 600 Roanoke Bldg., Minneapolis, 2, Minn.

ETHYL CELLULOSE BOOKLET

A new edition of technical booklet contains much new and revised information on applications and formulation of ethyl cellulose. The booklet covers such subjects as description and properties of ethyl cellulose, solvents, resins and plasticizers. Formulation and specific application are also included. Entitled "Ethyl Cellulose, Properties and Uses", it can be obtained from the Hercules Powder Co., Inc., Wilmington 99, Del.

WOOD-PRESERVATIVE DATA

A Recommended Commercial Standard for Zinc Naphthenate Wood-Preservative (Spray, Brush, Dip Application) has recently been circulated by the Commodity Standards Division of the National Bureau of Standards to manufacturers, distributors, users, and testing laboratories for acceptance.

The purpose of this Commercial Standard is to provide a nationally-recognized specification for zinc naphthenate wood-preservative for the guidance of producers, distributors, and users; to promote fair competition and consumer confidence in products conforming to this standard; and to provide a basis for labelling and guaranteeing the quality of the product. This standard covers physical and chemical characteristics of zinc naphthenate products supplied in either concentrated form, or ready-for-use form.

Mimeographed copies, TS-4859, of this Recommended Commercial Standard may be obtained from the Commodity Standards Division, National Bureau of Standards, Washington 25, D. C.

MILL CATALOGS

Two catalogs describing three roller mills and mixers respectively for the printing ink industry are currently being made available by Charles Ross & Son Co.

Catalog 8-F gives detailed information together with illustrations on the new high speed roller mills, which has been recently marketed by this firm.

Catlog 21-E contains information on change can liquid and paste mixers. Descriptions of motor specifications, measurements, weights and construction data are also included. Copies of these catalogs may be obtained by writing to the Charles Ross & Son Co., 146 Classon Ave., Brooklyn, N. Y.

SYNTHETIC RESIN BOOKLET

A revised edition of the technical booklet describing properties and uses of Hercules Powder Company's syntheic resins is now available from Hercules, Wilmington, Del.

A key to specific uses for Hercules synthetic resins is provided on pages 10 and 11 by a chart which matches the resins with their actual and potential uses. From this index the formulator who is faced with a resin problem can pick out the resins indicated for use in a particular field. Then, by turning to the pages where these resins are briefly described, he can study the properties of the desirable resins only and thus more quickly select the resin or resins best adapted to his needs.

Resins described in this booklet are used in the manufacture of protective coatings, printing inks, linoleum and floor tile, asphalt compositions, essential oils, sizes for paper and textiles, binders for flameproof compositions.

TALL OIL BULLETIN

A thorough discussion on the uses of various forms of tall oil employed in drying oils is contained in this 4-page bulletin. The composition of various tall oils is given and methods of converting them into drying oils are covered. Properties of oxidized and esterified tall oils are also included.

Modified alkyd resins, from tall oil and dibasic acid anhydrides are discussed in connection with use in drying compounds. This bulletin may be obtained by writing to Tall Oil Association, 122 E. 42nd Street, New York 17, N. Y.

PLASTICIZER BULLETIN

A bulletin containing twenty-two plasticized polyvinyl chloride formulations noting the outstanding properties of each is available from Monsanto.

The formulators, based on extensive laboratory and field work, are representative of types used in manufacturing a wide range of articles, from shower curtains and raincoats, to upholstery material and floor tile.

Because of the variety of desirable properties plasticizers impart to polyvinyl chloride, best results are obtained by using various plasticizer blends. Monsanto Chemical Co., St. Louis, Mo.

ROLLER MILL BOOKLET

The Western Roy Alan Corp. has recently issued a four-page brochure on their 3-roller laboratory and standard 3-roller mills. The circular contains specific information and data on the construction of these machines and directions for operation. Western Roy Alan Corp., 20830 S. Normandie, Torrance, Calif.

PAINT BENCH CATALOG

Test benches for use at test stations in paint, varnish, lacquer, shellac, enamels, and related products plant can now be had in any length and in a variety of designs. Eighteen different all-steel units are available, including drawers, cupboards, sinks, tables, storage cases, etc. Units are two, three, four or five feet in length and make use of the plastic-impregnated stone called "Kemrock" for bench working surfaces. "Kemrock" is tough, smooth, black and resistant to chemically corrosive materials. An illustrated catalog giving details, dimensions, and prices can be obtained from the manufacturer. Fisher Scientific Co., 717 Forbes St., Pittsburg 19, Pa.

DUST CONTROL REPORT

How to overcome dust created in handling and mixing dry pigments for paint manufacture is revealed in a report issued by the American Wheelabrator and Equipment Corp., Mishawaka, Indiana. This report describes dust control systems at Sherwin-Williams Co., Chicago, Ill., and National Lead Co., Vernon, California.

OTS SERVICE

The Office of Technical Services of the U. S. Department of Commerce has announced that it was continuing its basic technical information services for industry during the coming 12-month period.

The OTS, which was granted a slight increase in its appropriation for the current fiscal year, will emphasize services particularly useful to smaller firms.

"In accordance with the desires of Congress and the Administration," John C. Green, director of the Office of Technical Services, stated, "we shall attempt to broaden the base of interest in federal technology. For example, we hope to serve firms that do not have their own laboratories or elaborate facilities."

Mr. Green also announced that the subscription price of the Bibliography of Technical Reports, the OTS monthly journal of technical abstracts, has been halved, and that it is now available at $5 per year. While the size of each issue will be reduced, he said, emphasis will be placed on selecting the most promising reports, and providing descriptive information with each regular entry.

A "Newsletter" is also now being published monthly, and is available at 50 cents per year. It is a bulletin highlighting business opportunities arising from federal research. Subscribers to the Bibliography receive the "Newsletter" without additional cost. Free sample copies of the "Newsletter" are available from OTS.

VIBRATION CONTROL

Typical equipment installation calling for vibration, shock, and noise isolation are illustrated in this 4 page bulletin.

Six sizes of isolation mountings are described, all utilizing steel springs as the isolating medium, together with resilient snubbers to absorb lateral thrusts. Loading range is from 75 lbs. to 12,000 lbs. per isolator, and dimensions are tabulated for each type.

An adjustable bolt is provided to hold machine in place and to provide a means for leveling the equipment.

The bulletin points out that these vibro-isolators make it practical to place machines where they belong in the plant layout with savings in materials handling time and costs, and with increases in production. Other advantages claimed are improved working conditions, lower maintenance, reduced foundation costs and reduced work spoilage. Write to the Korfund Co., 32nd Place, Long Island City 1, N. Y. and ask for Bulletin LK551.

GLYCEROL ESTERS

The physical properties and uses of higher fatty acid esters, specifically the esters of glycerols and many glycols and polyglycols are described in a 24 page brochure recently issued by the Glyco Products Company. These esters are used in emulsifying agents, stablizers and surface-active agents. They range from liquids of low freezing points to wax-like solids. Copies of this brochure will be sent upon request to chemists and other technical workers. Glyco Products Inc., 26 Court St., Brooklyn, N. Y.

PAINT TESTING BULLETINS

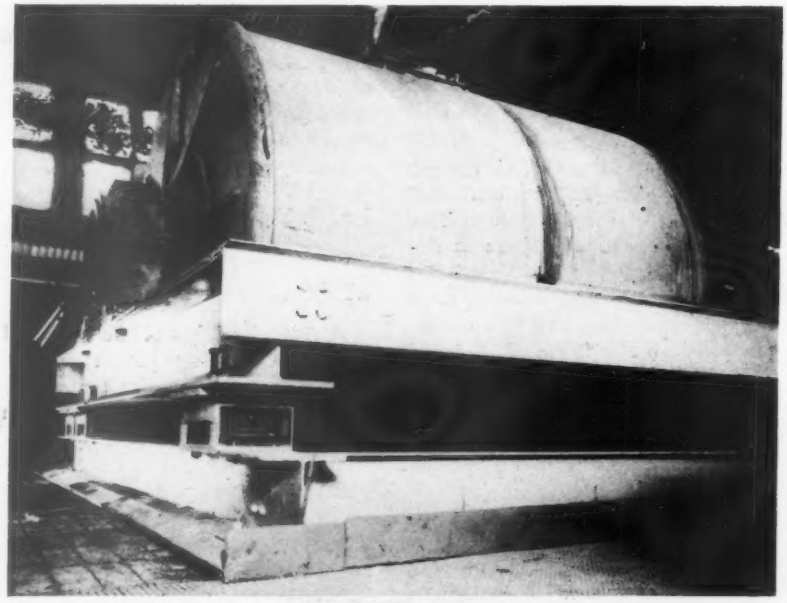
The Henry A. Gardener Laboratory, Inc. has announced the publication of the following bulletins describing three new paint testing apparatus:

"Dust-free tester for determining dust free time of paint films."

"Automatic blade applicator for laying down uniform films in hiding power determinations."

No. 4-Ford Aluminum Viscosity Cup, for viscosity determinations of paint materials.

These bulletins may be secured by writing to Henry A. Gardener Laboratory, Inc. 4723 Elm St., Bethesda 14, Maryland.



Korfund Vibro-Isolators

Inspection of Paint and Varnish Activity in Europe

Published by U. S. Dept. of Commerce, OTS, Washington 25, D. C. Price $1.00

Novel paint, varnish and lacquer products, as well as different types of maintenance methods, used in Europe are described in a report now available from the Office of Technical Services of the U. S. Department of Commerce.

The Report discusses British researches on Congo copal resins and allyl starch derivatives; and some of the raw material uses developed in Germany during the war.

Manufacture of paints and protective coatings is below European requirements according to the report, and maintenance methods for river, harbor and other exposed structures are often inadequate. Switzerland where the effects of the war were felt less than in other European countries, has been producing a number of new products, and its federal testing laboratory has developed a unique device for accelerated aging, the report states.

Several German developments are described fully in the report. Eleven distinctly novel German paint developments are discussed and two special synthetic resins with unusually versatile characteristics are described.

The report points out that many of the German developments, while ingenious in nature, do not necessarily rank above comparable products in the United States, since Germany's problem was to produce adequate substitutes with limited raw materials.

PB 97112, *Inspection of Paint and Varnish Activity in Europe,* 37 pages, sells for $1 per copy. Orders should be addressed to the Office of Technical Services. U. S. Department of Commerce, Washington 25, D. C., accompanied by check or money order payable to the Treasurer of the United States.

Organic Coatings in Theory and Practice

By Dr. A. V. Blom. Published by the Elsevier Publishing Co., Inc., New York City, New York. Price $6.00

In recent years, it has become customary to publish books on the technical aspects of organic coatings in the form of collected works by different authorities, each discussing one or more subjects. These collections have their own value as reference books and undoubtedly were found to be of considerable use to the technical people of the paint industry.

However, this book by Dr. A. V. Blom, Switzerland's most prominent coating expert, is different. It is not a collection of works, but the result of his life's professional work in organic coating chemistry.

The book offers, after fundamental considerations of the basic chemical conceptions of the film-forming process (pages 1–31), a review of film-forming materials both of the natural and synthetic types, (pages 31–124). There is also a section (pages 125–174) in which the author offers some interesting chemical interpretations of the air-drying and baking processes. Problems of pigmentation, with a discussion on the influence of particle size and shape, and the various considerations of pigment and vehicle ratios are also included. (pages 175–209).

The last part of the book is devoted to a discussion of the properties of various coating films, methods of testing, etc. Here, the author's wide experience as director of the Swiss Paint and Varnish Testing Station is readily recognized.

Although some of his colleagues will not fully agree on some of his theoretical deductions, they will follow these

Dr. Blom's book is well written and three hundred pages with interest. illustrated, and should find wide use among those who wish to obtain a more theoretical understanding of organic coating chemistry. Reviewed by Dr. Max Kronstein.

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CLUB NEWS

New York

A symposium on safety in paint varnish and lacquer manufacturing was held on September 8th in the afternoon. This was sponsored by the Joint Coordinating Committees of the New York Paint, Varnish and Lacquer Association and the New York Production Club. Six subjects on safety were covered, which have profound effect on the paint industry as a whole.

The following men were selected to give talks on these subjects: Warren A. Cook spoke on the Toxicity of Solvents, specifically those which are used in paint, varnish and lacquer manufacturing. He is director of the Division of Industrial Hygiene and Engineering Research of the Zurich Accident, Liability and Fire Insurance Companies. Harold J. Segrave then gave a talk on Resume of Respiratory Protection in the Paint and Varnish Industry. He is presently district manager of the Mine Safety Appliance Company. Arthur J. Kleissler of the G. A. Kleissler Co. then spoke on Fume and Dust Control in the Paint and Varnish Plant. Safety and Hazards in Handling Solvents was discussed by Allen C. Belyea of the Factory Mutual Engineering Division. Harold L. Miner of E. I. duPont de Nemours & Co. followed with a talk on Safety in Color Code for Industry. C. L. Jones concluded with a discussion of Safety in Lacquer Manufacture.

The afternoon session was followed by the regular dinner meeting. Dr. C. B. F. Young of the National Southern Products Corp. gave an interesting talk on the use of tall oil in paint and varnishes, closing with a brief history of National Southern Products Corp., illustrated with slides

The October dinner meeting was held on October 6th. The program for the evening consisted of a report by the Technical Committees. Each Sub-Committee presented a summary of their activities during the year, which included the following:

Sub-Committee #14: Quantitative Measurements of Adhesion Chairman—Frederick M. Damitz

Sub-Committee #36: Accelerated Evaluation of Floor Coatings Chairman—Harlan E. Althouse

Sub-Committee #37: Investigation of Methods for Measuring Drying Time Chairman—Joseph J. Stivale, Jr.

Sub-Committee #52: Fume Control Chairman—John A. Murphy

Sub-Committee #53: A Study of Pigment Dispersion Chairman—E. K. Zimmermann

Sub-Committee #54: A Study of the Dielectric Strength of Paint, Varnish and Lacquer Films Chairman—Dr. Marcus Thau

Sub-Committee #58: Standards and Methods of Test Chairman—Henry F. Payne

Sub-Committee #60: New Problems Chairman—Edwin P. Peterson

Sub-Committee #61: Flooding and Floating Chairman—Anthony Skett

Papers by Sub-Committees 35 and 54 are to be presented at the Annual Convention in Atlantic City. Following these reports, movies of the June outing were shown.

C-D-I-C

The Cincinnati-Dayton-Indianapolis-Columbus Club September meeting was held on September 12th with 66 members and guests present.

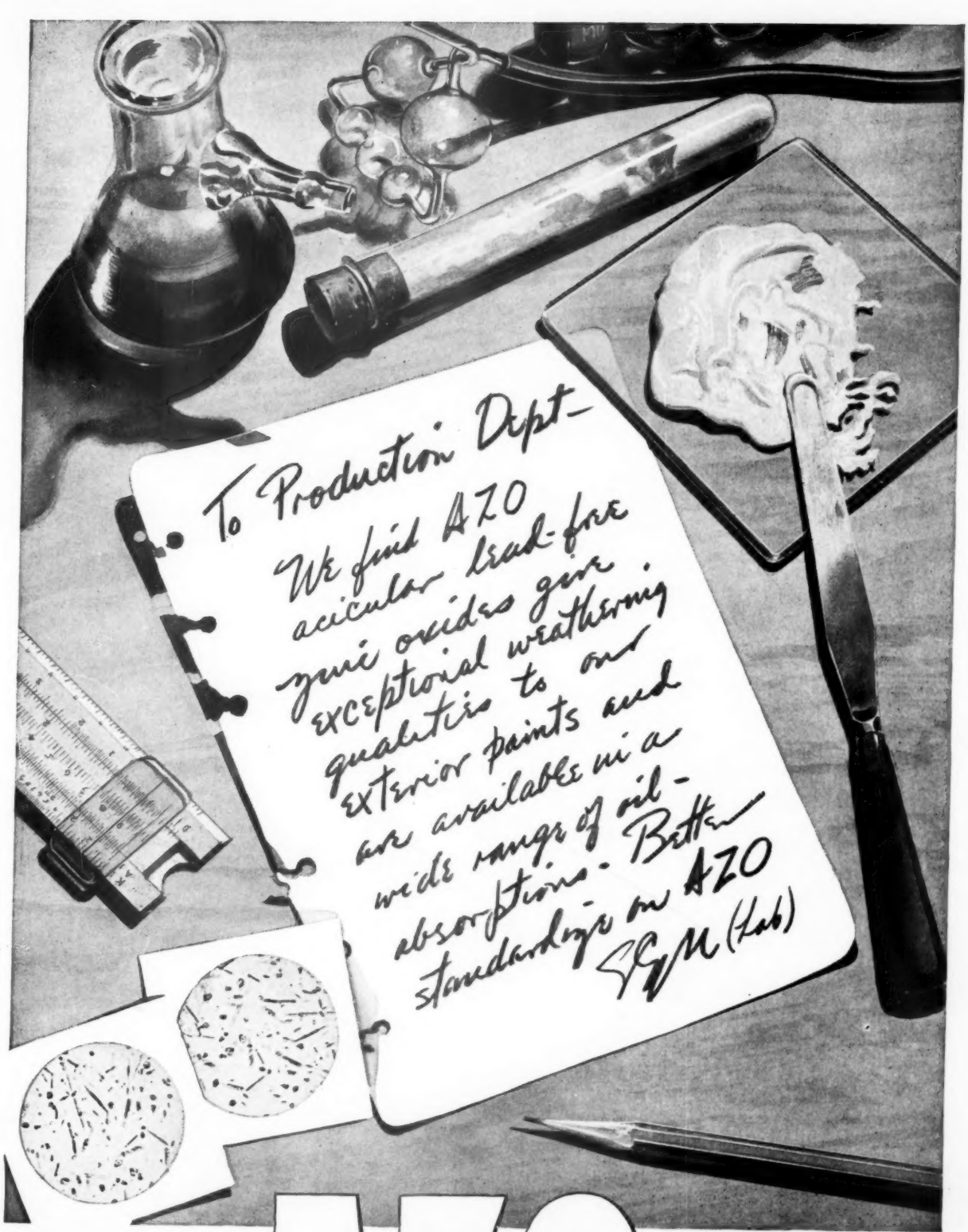
Mr. Gordon M. Babcock of the Reynolds Metal Company showed an interesting movie entitled "The Tale of Powdered Pig", depicting the various methods of making aluminum flakes from crude ore, and also showing some of the many uses of this pigment. He was followed by Oscar P. Miller of the National Lead Company who spoke on the three types of Bentone pigments: Bentone 8, a flattening agent that may be stirred in a lacquer or enamel to obtain varying degrees of flatness; Bentone 18, a high swelling agent for use with combinations of polar and non-polar solvents; and Bentone 34 for maximum swelling with petroleum type solvents. All of these pigments are in pilot plant stage and limited quantities are available, it was pointed out.

Chicago

The September meeting was held on the 12th of the month.

A film entitled "Fire and How to Fight It" was shown. The guest speaker was Dr. Otto Eisenschiml of the Scientific Oil Compounding Company, who spoke on "Meandering Though Life."

Mr. Eisenschiml opened his talk recalling the early stages of the soybean industry in the United Sates, and how much difficulty he had selling the first 20 barrels he made. He related some queer experiences he had as chairman of the Rules Committee of the National Soybean Process Association. He stressed the importance of the Board of Appeals to interpret all specifications, pointing out that no specification can cover all contingencies, and while technical progress goes on, specifications stand still. This point was further illustrated by the role which Argentine Tung Oil will play in the near future, and the deterioration of Chinese and domestic tung oil while in storage during the last war.



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